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AMERICAN GEOGRAPHICAL SOCIETY
OF
NEW YORK

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VOL. XVIII

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AMERICAN GEOGRAPHICAL SOCIETY.

OFFICERS AND COUNCILLORS, 1886.

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CHARTER OF INCORPORATION.

GRANTED APRIL 13, 1854.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. George Bancroft, Henry Grinnell, Francis L. Hawks, John C. Zimmerman, Archibald Russell, Joshua Leavitt, William C. H. Waddell, Ridley Watts, S. De Witt Bloodgood, M. Dudley Bean, Hiram Barney, Alexander J. Cotheal, Luther B. Wyman, John Jay, J. Calvin Smith, Henry V. Poor, Cambridge Livingston, Edmund Blunt, Alexander W. Bradford, and their associates, who are now or may become hereafter associated for the purposes of this act, are hereby constituted a body corporate by the name of "The American Geographical and Statistical Society," for the purpose of collecting and diffusing geographical and statistical information.

§ 2. For the purposes aforesaid, the said Society shall possess the general powers and privileges, and be subject to the general liabilities, contained in the third title of the eighteenth chapter of the first part of the Revised Statutes, so far as the same may be applicable, and may not have been modified or repealed ; but the real and personal estate which the said Society shall be authorized to take, hold, and convey, over and above its library, and maps, charts, instruments, and collections, shall not at any time exceed an amount the clear yearly income of which shall be ten thousand dollars.

§ 3. The officers of said Society shall be a president, three vice-presidents, a corresponding secretary, a recording secretary, a librarian, and a treasurer and such other officers as may from time to time be provided for by the by-laws of the said Society.

§ 4. The said Society, for fixing the terms of admission of its members, for the government of the same, for changing and altering

the officers above named, and for the general regulation and management of its transactions and affairs, shall have power to form a code of by-laws, not inconsistent with the laws of this State, or of the United States, which code, when formed and adopted at a regular meeting, shall, until modified or rescinded, be equally binding as this act upon the said Society, its officers, and its members.

5. The Legislature may, at any time, alter or repeal this act.

6. This act to take effect immediately.

STATE OF NEW YORK, } ss.:
Secretary's Office,

I have compared the preceding with the original law on file in this office, and hereby certify the same to be a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this
[L. S.] thirteenth day of April, one thousand eight hundred and fifty-four.

A. G. JOHNSON,
Deputy Secretary of State.

AMENDED CHARTER.

PASSED APRIL 8, 1871.

STATE OF NEW YORK, NO. 237, IN SENATE. *March 7, 1871.*—
Introduced with unanimous consent, by Mr. Bradley; read twice,
and referred to the Committee on Literature; reported favorably
from said committee, and committed to the Committee of the
Whole.

CHAP. 373.

AN ACT in relation to The American Geographical and Statistical
Society.

PASSED April 8, 1871.

*The People of the State of New York, represented in Senate and
Assembly, do enact as follows:*

SECTION 1. The name or corporate title of the said Society shall
hereafter be The American Geographical Society of New York.

§ 2. The object of the said Society shall be the advancement of
geographical science; the collection, classification and scientific
arrangement of statistics, and their results; the encouragement of
explorations for the more thorough knowledge of all parts of the
North American continent, and of other parts of the world which
may be imperfectly known; the collection and diffusion of geo-
graphical, statistical and scientific knowledge, by lectures, printed
publications, or other means; the keeping up of a correspondence
with scientific and learned societies in every part of the world, for
the collection and diffusion of information, and the interchange of
books, charts, maps, public reports, documents, and valuable publica-

tions ; the permanent establishment in the city of New York of an institution in which shall be collected, classified, and arranged, geographical and scientific works, voyages, and travels, maps, charts, globes, instruments, documents, manuscripts, prints, engravings, or whatever else may be useful or necessary for supplying full, accurate, and reliable information in respect to every part of the globe, or explanatory of its geography, physical and descriptive ; and its geological history, giving its climatology, its productions, animal, vegetable, and mineral ; its exploration, navigation, and commerce ; having especial reference to that kind of information which should be collected, preserved, and be at all times accessible for public uses in a great maritime and commercial city.

§ 3. The power given by the act hereby accorded to the said Society, to take, hold, convey, manage, and make use of its real and personal estate, shall be understood as authorizing said Society to take and hold by gift, grant, bequest, devise, subject to all provisions of law relative to devises and bequests by last will and testament, or purchase real estate to the value of three hundred thousand dollars, and to invest its income, or its personal estate generally, so as to produce a regular annual income sufficient for the accomplishment of the purposes set forth in the first section of this act ; but said annual income shall not exceed twenty-five thousand dollars annually.

§ 4. The said Society shall make an annual report of its proceedings to the Legislature.

STATE OF NEW YORK, }
Office of Secretary of State, } ss. :

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this twenty-second day of May, in the year one thousand eight hundred and seventy-one.

DIEDRICH WILLERS, JR.,
Deputy Secretary of State.

BY-LAWS.

CHAPTER I.

TITLE.

The title of the Society is, "The American Geographical Society."

CHAPTER II.

OBJECTS.

The objects of the Society are, "The collecting and diffusing of geographical and statistical information."

CHAPTER III.

MEMBERS.

1. The Society shall consist of Fellows, Honorary, Corresponding, and *ex-officio* members.
2. Honorary members shall be chosen on account of their distinction in the science of geography or statistics, and not more than twelve of them shall hereafter be elected in any one year.
3. Corresponding members shall be chosen from those who have aided the advancement of geography or statistics.
4. *Ex-officio* members shall be foreign diplomatic representatives and consuls resident in the United States ; and United States diplomatic representatives and consuls in foreign countries.
4. Fellows and Corresponding and Honorary members shall be elected as follows : All nominations of candidates shall be openly made in writing at a meeting of the Society, or the Council, by a member thereof, and, together with the name of the member making them, entered on the minutes. The persons thus nominated, when

approved by the Council and elected by the Society, shall, on payment of the initiation fee, if nominated as Fellows, and without such payment if nominated as Corresponding or Honorary members, become members of the Society accordingly.

6. Persons entitled to become *ex-officio* members of the Society shall, on the recommendation of the Council, be, by the Society, constituted and declared to be such members.

7. The name of any member of the Society may, on the recommendation of the Council, and by a vote of two thirds of the members present at a stated meeting of the Society, be dropped from the roll of its members.

CHAPTER IV.

INITIATION FEE AND ANNUAL DUES.

1. The initiation fee, including the dues for the current year, shall be, for a Fellow, ten dollars, to be paid immediately on election.

2. The annual dues thereafter shall be, for a Fellow, ten dollars, to be paid in advance.

3. Any Fellow of the Society, not in arrears, may commute for life all dues for fellowship by the payment at one time, if a Fellow, of one hundred dollars.

4. The name of any Fellow of the Society neglecting for two successive years to pay his annual dues, or at any time wholly refusing to pay them, may by the Council be erased from the list of Fellows of the Society.

5. The fiscal year of the Society shall, for all purposes, be the calendar year—that is, commence on the first day of January, and end with the 31st day of December in each year.

CHAPTER V.

OFFICERS.

1. The officers of the Society shall be a president, three vice-presidents, a foreign corresponding secretary, a domestic corresponding secretary, a recording secretary, a treasurer, and fifteen councillors; and these, together, shall form the Council of the Society.

2. The officers and members of Council elected at the next

annual election (except the president and treasurer) shall, at their first meeting, divide themselves into three classes, each to embrace one vice-president, one secretary, and five members of the Council ; one of which classes shall hold office one year, one for two years, and another for three years, to be determined at said meeting by lot or otherwise. The president and treasurer shall always be elected annually ; and at each annual election thereafter there shall be elected a vice-president, a secretary, and five members of Council, each for the term of three years.

3. All officers of the Society to be chosen at any election may be voted for on one ballot.

CHAPTER VI.

ANNUAL MEETING.

1. The annual meeting of the Society shall be held on the second Tuesday after the first day of January in each and every year hereafter, when the annual election of the officers of the Society shall take place ; and if, from any cause, there shall be a failure of the annual election at the time above designated for that purpose, the same may be held on the Tuesday next following—that is, on the third Tuesday after the first day of January in each year—and of which due notice shall be given.

2. Every member of the Society, who has been such for twenty days or more, and who is not in arrears for his dues for the past year, shall be entitled to vote at the said election.

3. At the annual meeting of the Society the Council shall present a general report of its proceedings and of those of the Society during the past year, and the secretaries and the treasurer shall also present their annual reports.

CHAPTER VII.

MONTHLY AND SPECIAL MEETINGS.

1. The Society, unless otherwise specially ordered by the Society or the Council, shall hold its stated meetings for the transaction of business on the second Tuesday of each month of the year, except July, August, and September.

2. The president, or, in his absence, one of the vice-presidents, may, and upon the written request of five members, shall, call a

special meeting of the Society by giving three days' notice thereof in two daily newspapers published in the city of New York.

CHAPTER VIII.

ORDER OF BUSINESS.

1. At all stated meetings of the Society for the transaction of ordinary business the order of proceedings shall be as follows :

1. Reading of the Minutes.
2. Reports and Communications from Officers of the Society.
3. Reports from the Council.
4. Reports from Committees.
5. Nominations of Members.
6. Special Orders.
7. Unfinished Business.
8. Miscellaneous Business.
9. Papers Read and Addresses Delivered before the Society.

2. All propositions presented for the action of the Society at any of its meetings shall be in writing, when requested by the presiding officer or any member. A proposition thus presented, when seconded and the question thereon stated from the chair, shall be deemed to be in the possession of the Society and open for discussion, but may be withdrawn by the mover at any time before amendment or decision.

3. No member shall speak more than once upon the same question until all the other members present desiring to speak shall have spoken, nor more than twice on any question without leave of the Society.

CHAPTER IX.

QUORUM.

At all meetings of the Society nine members present shall constitute a quorum for the transaction of business.

CHAPTER X.

COMMITTEES.

All committees authorized by the Society shall, unless otherwise specially ordered, consist of three members each, and be appointed by the presiding officer.

CHAPTER XI.

PRESIDING OFFICER.

At all meetings of the Society, on the arrival of the appointed hour and the presence of a quorum, the president, or in his absence one of the vice-presidents, or in the absence of both a chairman *pro tem.*, shall immediately take the chair, call the meeting to order, and preside. He shall have only a casting vote. He shall preserve order and decide all questions of order, subject to an appeal to the Society. He shall also, unless otherwise specially ordered, appoint all committees authorized by the Society ; and at every annual election, before the opening of the polls, he shall appoint two tellers of the election.

CHAPTER XII.

SECRETARIES.

1. Foreign Corresponding Secretary.—It shall be the duty of the foreign corresponding secretary to conduct the general correspondence of the Society with individuals and associate bodies in foreign countries.

2. Domestic Corresponding Secretary.—It shall be the duty of the domestic corresponding secretary to conduct the Society's general correspondence with individuals and associate bodies in the United States.

3. Both the foreign and domestic secretaries shall keep in suitable books to be provided for that purpose, at the Society's rooms, true copies of all letters written by them respectively on behalf of the Society ; and shall preserve, on proper files, at the said rooms, all letters received by them on the same account ; and at each stated meeting of the Society or the Council, they shall respectively report their correspondence, and read the same, or such parts thereof as may be required.

4. In case of vacancy in the office of either of the corresponding secretaries, or in the absence or disability of either of these officers, the duties of both may be performed by the other corresponding secretary.

5. The Society may designate a particular officer, or appoint a committee to prepare a letter or letters on any special occasion.

6. Recording Secretary.—It shall be the duty of the recording

secretary to give due notice of the time and place of all meetings of the Society, and to attend the same. He shall keep fair and accurate minutes of the proceedings of the Society, and record the same, when approved, in the Society's Journal. He shall give immediate notice to the several officers and committees of the Society, of all votes, orders, resolves, and proceedings of the Society affecting them or appertaining to their respective duties. He shall prepare a list of the members of the Society entitled to vote, to be handed to the tellers before the opening of the polls at each annual election. He shall officially sign and affix the corporate seal of the Society to all diplomas and other instruments or documents authorized by the Society or Council. He shall have charge of the corporate seal, charter, by-laws, records, and general archives of the Society, except so far as they may be expressly placed under the charge of others. He shall certify all acts and proceedings of the Society, and shall notify the Council of the death, resignation, or removal of any officer or member of the Society. He shall have charge of the rooms of the Society, and shall perform all such other and further duties as may from time to time be devolved upon him by the Society or the Council. He, together with the Council, shall have the charge and arrangement of the books, maps, and collections belonging to the Society. He shall cause to be kept in the rooms of the Society a registry of all donations to the library or collections of the Society, acknowledge their receipt by letter to the donors, and report the same in writing to the Society at its next stated meeting.

7. All documents relating to the Society and under the charge of the secretaries respectively, shall be placed in such depositories in the rooms of the Society as the Council may provide and designate for that purpose.

CHAPTER XIII.

TREASURER.

The Treasurer shall have charge of and safely keep all contracts, certificates of stock, securities, and muniments of title belonging to the Society. He shall collect the dues and keep the funds of the Society, and disburse the same under the direction of the Council; and so often as the said funds in the hands of the treasurer shall amount to one hundred dollars, he shall deposit the same, in the

name of the Society, in some incorporated bank in the city of New York, to be designated for that purpose by the Council; and the said funds, thus deposited, shall be drawn out of the said bank on the check of the treasurer, countersigned by the chairman of the Council, and only for the legitimate and authorized purposes of the Society. The treasurer shall, previous to the annual meeting of the Society, prepare and submit to the Council for audit, a detailed account of his receipts and disbursements for account of the Society during the past year; and which annual account, duly audited, he shall present, with his general report, to the Society at its annual meeting.

CHAPTER XIV.

COUNCIL.

1. The Council shall have the management and control of the affairs, property, and funds of the Society, and shall designate an incorporated bank in the city of New York, where the said funds shall, from time to time as they accrue, be deposited by the treasurer.

2. It may frame its own by-laws, not inconsistent with the charter or by-laws of the Society.

3. It shall appoint the necessary agents, clerks, and servants of the Society, with such powers and duties, privileges and compensation as it may from time to time determine; and may at pleasure revoke such appointments, and make others in their stead.

4. It shall have power to fill, for the unexpired term, any vacancy that may occur in any of the offices of the Society.

5. It shall have power, at its discretion, to declare vacant the seat of any member of its own body (except the president and vice-presidents) who shall have been absent from its meetings for three successive months; and also by a vote of a majority of the whole Council to remove from its own body any member thereof for cause; but in such case it shall be the duty of the Council to report every such vacancy or removal to the Society, at its next stated meeting thereafter, when such cases shall be subject to review by the Society.

6. It shall not, without an approving vote of the Society at a stated meeting thereof, make any contract whereby a liability in amount above one thousand dollars may be incurred by the Society nor

without such vote make any sale or disposition of the property of the Society exceeding that sum in value:

7. The Council may, in its discretion, remit the initiation fee or annual dues of any member of the Society.

8. No member of the Council shall receive any salary or pecuniary compensation for his services.

9. The Council shall hold stated meetings for the transaction of business at least once in every month, except the months of July, August, and September.

10. At all meetings of the Council, five members present shall constitute a quorum for the transaction of business.

CHAPTER XV.

GENERAL PROVISION AS TO DEBT.

No debt on account of the Society, beyond the funds in the treasury for its payment, shall for any purpose, at any time, be incurred; and if at any time it shall appear that there are resting upon the Society pecuniary obligations beyond the funds in the treasury for their liquidation, no appropriation of funds from the treasury whatever, except for the necessary current expenses of the Society, shall be made, until the said pecuniary obligation shall be fully discharged, or the funds necessary for their extinction shall have been set apart for that purpose.

CHAPTER XVI.

ALTERATION OF THE BY-LAWS.

No alteration in the by-laws of the Society shall be made unless openly proposed at a stated meeting of the Society, entered on the minutes, with the name of the member proposing the same, and adopted by the Society at a subsequent meeting, by a vote of two thirds of the members present.

CHAPTER XVII.

ADOPTION OF THE BY-LAWS.

The foregoing are hereby adopted and declared to be the by-laws of the Society; and all by-laws of the Society heretofore adopted are hereby rescinded and declared to be null and void.

HONORARY AND CORRESPONDING MEMBERS AND FELLOWS.

HONORARY MEMBERS.

- | | |
|--|--|
| BAKER, Sir Samuel W., F.R.S.,
F.R.G.S. | retary of the Royal Geographical
Society. |
| CONSTANTINE, the Grand Duke, Presi-
dent of the Imperial Russian Geo-
graphical Society, St. Petersburg. | NARES, Sir George S., R.N., K.C.B. |
| DUFFERIN, the Earl of, Viceroy and
Gov.-General of India. | NORDENSKIÖLD, Professor A. E.,
Stockholm. |
| ELDER, Sir Thomas, Adelaide, South
Australia. | PEDRO II., Emperor of Brazil. |
| ISMAIL, ex-Khedive of Egypt. | RAWLINSON, Major-General Sir Henry
C., K.C.B., Vice-President of the
Royal Geographical Society. |
| LAYARD, Sir Austen Henry, D.C.L. | STRUVE, Professor Otto Wilhelm von,
St. Petersburg. |
| MARKHAM, Clements R., K.C.B., Sec- | WILCZEK, Count H., Vienna. |

CORRESPONDING MEMBERS.

- | | |
|--|---|
| ABBE, Prof. Cleveland, Washington. | BECKER, Prof. M. A., Vienna. |
| ALTAMIRANO, Ignacio, Mexico. | BLACKIE, Walter G., Ph.D., F.R.G.S.,
Glasgow. |
| AMMEN, Rear-Admiral Daniel, U.S.N.,
Washington. | BOM RETIRO, Viscount, President of
the Instituto Historico Geographico,
Rio de Janeiro. |
| ARSENIOW, George, St. Petersburg. | BOTASSI, Demetrius, Consul-General of
Greece, New York. |
| ASBJÖRNSEN, P. C., Christiania, Nor-
way. | BRAINE, Capt. D. L., U.S.N., Wash-
ington. |
| BALFOUR, David M., Boston, Mass. | BREWER, Prof. Wm. H., New Haven,
Conn. |
| BARANDA, Joaquin, Mexico. | BRIGHT, John, M.P., London. |
| BARCLAY, James T., M.D., Jerusalem. | BROWNLEE, HARRISON J., C.E., Mani-
toba. |
| BARNARD, Henry, LL.D., Hartford,
Conn. | |
| BARTHOLOMEW, John, Edinburgh. | |
| BASAROFF, Ed. Ivan de, Stuttgart. | |
| BASTIAN, Dr. Adolph, Berlin. | |

- BUSHNELL, Rev. Albert, Gaboon, Africa.
- CHAIX, Prof. Paul, Geneva, Switzerland.
- CHANDLES, W., F.R.G.S., London.
- DANENHOWER, Lieut. J. W., U.S.N., Newport, R. I.
- DO CANTO, Dr. Ernesto, St. Michaels, Azores.
- DRAPER, Lyman, Madison, Wis.
- FOULKE, Ensign G. C., Washington.
- FRITSCH, Hugo O., New York.
- GARDNER, Prof. James T., Albany.
- GILLIODTS-VAN SEVEREN, L., LL.D., Bruges.
- GILMAN, Daniel C., LL.D., President Johns Hopkins University, Baltimore.
- HAGUE, J. D., New York.
- HALDERMAN, Hon. John A.
- HANCOCK, Prof. W. N., LL.D., Dublin.
- HAYDEN, Prof. F. V., Washington.
- HEATH, Dr. E. R., Wyandotte, Kansas.
- HITCHCOCK, Prof. C. H., Ph.D., Hanover, N. H.
- HOCHSTETTER, Dr. Ferdinand von, Vienna.
- HOSMER, Dr. George, New York.
- HOTCHKISS, Maj. Fred., Staunton, Va.
- HOUGH, Franklin B., M.D., Washington.
- HUNT, Prof. T. Sterry, LL.D., Boston.
- JACKSON, John P., Berlin.
- JOHNSTON, W. E., M.D., Paris.
- LACROZE, Julius, C.E., Buenos-Ayres.
- LAMANSKY, Eugene von, St. Petersburg.
- LEFROY, Gen. Sir John Henry, B.A., London.
- LESSEPS, Ferdinand de, Paris.
- LONG, Col. C. Chaillé.
- LUCE, Capt. S. B., U.S.N., Newport, R. I.
- MALTE-BRUN, V. A., Hon. Sec'y of the Société de Géographie, Paris.
- MARISCAL, Ignacio, Mexico.
- MARTIN, Rev. W. A. P., President of the Imperial College, Pekin.
- MATHEWS, F. A., U.S. Consul-General, Tangier, Morocco.
- MAUNOIR, Charles, Paris.
- MAURY, Louis Ferdinand Alfred, Paris.
- MCCARTEE, D. Bethune, M.D., Summit, N. J.
- MELLO, Dr. T. G. M., Rio de Janeiro.
- MORGAN, Henry Jas., Ottawa, Canada.
- NAPRSTEK, V., Prague, Bohemia.
- NASSAU, Rev. R. H., Gaboon, Africa.
- NEGRI, Cristoforo, Turin.
- NEWMARCH, William, Hon. Sec'y of Statistical Society, London.
- NEY, Cte. Napoléon, Paris.
- ORTIZ, Angel D., Seville.
- PACKARD, Prof. A. S., Providence, R. I.
- PASSMORE, Frank B., C. E., New Zealand.
- PERALTA, Manuel M. de, Liege.
- POESCHE, Theodore, Washington.
- PORTO SEGURO, Viscount, Envoy of Brazil at Vienna.
- PUMPELLY, Prof. R., Newport, R. I.
- RAE, John, M.D., London.
- RAIMONDI, Antonio, Lima, Peru.
- RAYMOND, Major Chas. W., U.S.A.
- ROHLFS, Gerhard, M.D.
- ROMERO, Matias, Envoy of Mexico at Washington.
- ROTHROCK, J. T., M.D., Wilkesbarre, Pa.
- SAPUCAHY, Viscount, Rio de Janeiro.
- SCHLAGINTWEIT-SAKÜNLÜNSKI, Robert von, Giessen, Germany.
- SCHUMACHER, John, Altona, Germany.
- SCHUYLER, Hon. Eugene.
- SELFDRIDGE, Comm. T. O., U.S.N., Washington.
- STANLEY, Henry M., Africa.
- STARRING, Gen. F. A., Paris.
- STEELE, J. B., Hongkong.

STONE, Gen. Chas. P., New York.	WHEELER, Capt. Geo. M., U.S.A., Washington.
TILLEY, Sir S., Ottawa, Canada.	WRIGHT, Gen. Horatio G., U.S.A., Washington.
VAN CAMPEN, Sam'l Richard, F.R.G.S., C.M.G.S.N., London.	WYSE, Lieut.-Comm. Lucien N. B., Paris.
VINCENT, Frank, Jr.	YOUNG, Jess., F.R.G.S., Wisbeach, England.
VIVIER DE ST.-MARTIN, Versailles.	
WALKER, Gen. Francis A., New Haven, Conn.	
WALLING, H. F., C.E., Washington.	

FELLOWS.

CORRECTED TO DECEMBER 31, 1886.

Date of Election.

1859 Arnoux, Hon. William H.
1859 Arnold, David H. (L. F.)
1860 Acton, Thomas C.
1869 Auchmuty, Richard Tylden.
1871 Atterbury, Rev. Wm. W., D.D.
1872 Allen, Horatio M.
1873 Albert, Halpern.
1874 Alexander, Junius B.
1874 Aufermann, August.
1874 Acker, David D.
1874 Avery, Samuel P. (L. F.)
1874 Agnew, John T. (L. F.)
1874 Arnold, Richard.
1874 Allen, Henry Wilder.
1874 Amy, Henry. (L. F.)
1874 Agnew, Alexander McL.
1874 Astor, Hon. W. W. (L. F.)
1874 Appleton, D. S.
1875 Amsinck, Gustav.
1876 Appleton, Nathan.
1879 Austin, William.
1879 Agostini, Joseph.
1879 Agnew, Cornelius R., M.D.
1879 Ashley, L. Seymour.
1879 Astor, John Jacob. (L. F.)
1881 Allen, Eben S.
1881 Armour, Herman O. (L. F.)
1883 Ames, Adelbert.
1883 Aub, Albert.

Date of Election.

1883 Atterbury, J. T. (L. F.)
1883 Adams, Coe.
1883 Aikman, Walter M.
1883 Adams, William.
1884 Abbott, Frank, M.D.
1884 Adler, I., M.D.
1885 Agnew, Andrew G.
1885 Adams, C. H.
1885 Auchincloss, E. S.
1886 Appleton, Wm. H.
1886 Agassiz, Prof. Alex.
1886 Allen, Chas. Slover, M.D.
1886 Allien, Henry V.
1886 Alden, R. Percy.
1886 Affleck, J. A.
1886 Avery, Rush E.

1852 Bancroft, Hon. George. (L. F.)
1852 Barney, Hiram. (L. F.)
1853 Brown, James M.
1856 Baker, Francis. (L. F.)
1856 Brevoort, J. Carson.
1859 Brown, James. (L. F.)
1859 Boorman, J. Marcus. (L. F.)
1859 Bernheimer, Isaac.
1859 Belmont, August. (L. F.)
1859 Barlow, S. L. M.
1865 Banvard, John. (L. F.)
1868 Banks, David.

- 1868 Beckwith, N. M.
 1868 Bennett, James Gordon.
 1868 Bernheimer, Adolph.
 1868 Bernheimer, Simon.
 1868 Brady, Hon. John R.
 1869 Bailey, Jas. Mühlenberg. (L. F.)
 1869 Banyer, Goldsboro.
 1869 Bickmore, Prof. A. S.
 1869 Bierstadt, Albert.
 1870 Butler, Cyrus.
 1870 Bishop, T. Alston. (L. F.)
 1872 Brown, Walston H.
 1873 Bailey, N. P.
 1874 Bishop, D. W. (L. F.)
 1874 Bien, Julius.
 1874 Bartlett, Willard.
 1874 Bissinger, Philip.
 1874 Backus, Henry C. (L. F.)
 1874 Baldwin, Townsend B.
 1874 Barnes, John S.
 1874 Bonner, Robert.
 1874 Bonn, William B.
 1874 Barnard, Horace.
 1874 Benjamin, John.
 1874 Butler, William Allen.
 1874 Bartow, Morey H.
 1874 Barr, William.
 1874 Belding, Milo M.
 1874 Bookstaver, Hon. Henry W.
 1874 Brownson, Lieut. W. H., U.S.N.
 (L. F.)
 1875 Barney, Charles T.
 1875 Beaman, Charles C., Jr.
 1875 Bernheimer, J. A.
 1875 Beckwith, Leonard F.
 1875 Beekman, Gerard.
 1875 Brownell, Silas B.
 1875 Brown, Vernon H.
 1875 Barnes, William.
 1875 Beste, Henry.
 1875 Bredt, Ernest.
 1875 Belknap, Capt. Geo. E., U.S.N.
 1875 Bowie, Augustus J., Jr.
 1876 Baldwin, Rear-Admiral Charles
 H., U.S.N.
 1876 Brower, John.
 1876 Billings, Frederick.
 1877 Booth, George.
 1877 Bixby, Robert F. (L. F.)
 1877 Börs, Christian.
 1877 Blanchard, George R.
 1877 Blatchford, Eliphalet W.
 1878 Bliss, Cornelius N. (L. F.)
 1878 Barton, Oliver Grant. (L. F.)
 1878 Brown, Rev. Philip A. H.
 1878 Brand, James.
 1878 Brown, J. Romaine.
 1879 Barattoni, C. A.
 1880 Bayard, Edward, M.D.
 1880 Beach, Hon. Miles.
 1880 Banks, D. S. (L. F.)
 1881 Baldwin, Edwin.
 1881 Baldwin, Christopher C.
 1881 Babcock, Samuel D.
 1881 Backus, Henry Landon.
 1882 Bamberger, Jacob F.
 1882 Belton, Frank S.
 1882 Brouwer, George H.
 1882 Baldwin, Octavius D.
 1882 Ballin, Gustave N.
 1882 Bacon, Francis M.
 1882 Babcock, George H.
 1882 Barger, Samuel F. (L. F.)
 1882 Barney, Newcomb C.
 1882 Bowen, Francis C.
 1882 Barclay, J. Searle.
 1883 Brewster, Benj. (L. F.)
 1883 Barber, Herbert.
 1883 Bachem, C. H.
 1883 Baker, Cyrus O.
 1883 Beekman, Wm. B.
 1883 Berry, Oliver F.
 1883 Bowne, Walter. (L. F.)
 1883 Banta, Theodore M.
 1883 Bangs, Charles W.
 1883 Barr, Edward.
 1883 Bergen, Tunis G.
 1883 Battell, Robbins.
 1883 Bennett, Ludovic.
 1883 Benedict, Robert D.

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| 1883 Blake, Frederick D. | 1856 Crooks, Ramsay. (L. F.) |
| 1883 Bell, Capt. W. R. | 1868 Catlin, N. W. Stuyvesant. (L. F.) |
| 1883 Blackford, Eugene G. | 1868 Chapman, Joseph H. |
| 1883 Benson, Frank Sherman. | 1869 Cullum, Gen. George W., U.S. |
| 1884 Bentley, Henry. (L. F.) | Army. (L. F.) |
| 1884 Baxter, Archibald. | 1870 Conklin, William A. |
| 1884 Boynton, Nathaniel A. | 1872 Conklin, Eugene E. (L. F.) |
| 1884 Burrall, F. A., M.D. | 1872 Crawford, Gen. S. W., U.S.A. |
| 1884 Barton, Geo. De F. | 1872 Clark, E. V. |
| 1884 Bangs, Fletcher H. | 1874 Connery, Hon. T. B. |
| 1884 Barnes, Theodore M. | 1874 Campbell, Allan. |
| 1884 Beach, John H. | 1874 Church, Col. George E. |
| 1884 Bonner, G. T. | 1874 Christern, F. W. |
| 1884 Bates, David H. | 1874 Cockcroft, Jacob H. V. |
| 1884 Brookfield, William. | 1874 Chickering, Charles F. |
| 1884 Bassett, E. D. | 1874 Comstock, Cornelius |
| 1885 Brown, Horatio S. | 1874 Constable, James M. |
| 1885 Bliss, George T. | 1874 Ceballos, J. M. |
| 1885 Burnet, Robt. W. | 1874 Caswell, Wm. H. |
| 1886 Barker, P.C., M.D. | 1874 Crerar, John. |
| 1886 Bishop, J. Remsen. | 1874 Crocker, David. |
| 1886 Benjamin, Hon. S. G. W. | 1874 Crosby, Hon. J. Schuyler. |
| 1886 Brown, Hon. Addison. (L. F.) | 1874 Colgate, James B. |
| 1886 Bridgman, E. C. | 1874 Constantine, Andrew J. |
| 1886 Betts, C. Wyllys. | 1874 Corning, Hon. Erastus. |
| 1886 Bowne, John. | 1874 Cossitt, Frederick H. |
| 1886 Bostwick, J. A. (L. F.) | 1874 Coutan, Charles E. |
| 1886 Blakeman, Birdseye. | 1874 Conyngham, Wm. L. (L. F.) |
| 1886 Bowers, John M. | 1874 Crosby, Hiram B. |
| 1886 Bruno, Richard M. | 1874 Crocker, Geo. A. |
| 1886 Bradford, E. S., M.D. | 1874 Crocker, Wm. Baylies. |
| 1886 Bettens, Ed. D. | 1874 Chickering, George H. |
| 1886 Backus, J. Bayard. | 1874 Carter, Oliver S. |
| 1886 Bouvier, M. C. | 1875 Clendenin, J. W. |
| 1886 Babcock, Henry M. | 1875 Cameron, Sir Roderick W. (L. F.) |
| 1886 Beddall, Ed. F. | 1875 Cushman, W. F., M.D. |
| 1886 Berwind, Ed. J. | 1875 Cooper, George C. |
| 1886 Bliss, Alex. | 1875 Chittenden, S. B., Jr. |
| 1886 Bond, Frank S. | 1876 Cornell, John B. |
| 1886 Beattie, John. | 1876 Curtis, Benj. L. |
| | 1879 Coddington, Gilbert S. (L. F.) |
| 1852 Colton, Joseph H. (L. F.) | 1879 Caldwell, R. A., M.D. |
| 1855 Conkling, Col. Frederick A. | 1879 Childs, George W. |
| (L. F.) | 1880 Calvin, Delano C. |
| 1856 Cooper, Hon. Edward. | 1880 Cohen, Maurice S. |

- 1880 Collins, John C.
 1880 Cormack, John A.
 1880 Coverley, William.
 1881 Carnochan, J. M., M.D.
 1881 Canfield, Charles B.
 1881 Clinton, Henry L. (L. F.)
 1881 Coddington, Thomas B.
 1882 Calhoun, William.
 1882 Clarkson, Banyer.
 1882 Coudert, F. R., LL.D.
 1882 Conkling, Rev. N. W.
 1882 Cass, George W.
 1883 Clarke, Thos. C.
 1883 Chapman, Henry E. (L. F.)
 1883 Colbron, W. T.
 1883 Chase, H. D.
 1883 Clyde, W. P.
 1883 Clews, Henry.
 1883 Coit, George M.
 1883 Candler, Flamen B.
 1884 Claflin, John. (L. F.)
 1884 Coggeshall, Edwin W.
 1884 Cook, John C.
 1884 Carey, Henry T.
 1884 Cameron, A. M.
 1884 Connor, W. E.
 1884 Cummings, Geo. F.
 1885 Church, Wm. C.
 1886 Cary, Alanson.
 1886 Collyer, Rev. Robt.
 1886 Conger, Clarence R.
 1886 Crosby, Howard, D.D.
 1886 Cooke, Henry C.
 1886 Casey, Col. T. L., U.S.A.
 1886 Coffin, Edmund, Jr.
 1886 Church, Benjamin S.
 1886 Corthell, E. L.
 1886 Cornell, Chas. B.
 1886 Clarke, Stephen G.
 1855 Daly, Ex-Chief-Justice C. P.
 (L. F.)
 1855 Dunshee, Prof. Henry W.
 1856 Douglas, Andrew E.
 1856 Dodge, Wm. E., Jr.
 1858 Detmold, Wm., M.D.
 1859 Dickerson, E. N.
 1866 Darling, Hon. Wm. A.
 1868 Dwight, Prof. Theo. W.
 1868 Du Chaillu, Paul B.
 1868 Dennis, Charles. (L. F.)
 1870 Dash, John B.
 1870 Davis, Alexander J. (L. F.)
 1870 Drowne, Henry T.
 1870 Dinsmore, William B.
 1871 Daly, Hon. Joseph F.
 1873 Delano, Franklin H. (L. F.)
 1873 DePeyster, Gen. J. Watts. (L. F.)
 1874 Dillon, Romaine. (L. F.)
 1874 Dutilh, E.
 1874 Decker, Charles A.
 1874 Delafield, M. L.
 1874 Dana, Charles A.
 1874 Decker, John J.
 1874 Del Monte, Leonardo.
 1874 Du Bois, Wm. A.
 1874 Davis, John G.
 1874 Dalrymple, Alexander.
 1874 Dunscombe, Richard T.
 1874 Dun, R. G.
 1875 Darrow, William.
 1875 Davies, Julien T.
 1875 Du Bois, Eugene.
 1875 Davison, Charles A.
 1875 De Peyster, Frederic J. (L. F.)
 1875 Dommerick, L. F.
 1876 Drexel, Joseph W. (L. F.)
 1877 Day, Henry M.
 1877 Davis, Joseph Beale. (L. F.)
 1878 Dana, Charles.
 1878 Di Cesnola, Gen. L. B.
 1879 Dahlgren, Charles B.
 1879 Dodge, George E.
 1880 Deane, John H. (L. F.)
 1880 Dyckman, Isaac M.
 1880 Du Bois, James G.
 1880 Du Bois, Frederick N.
 1880 Dexter, Henry. (L. F.)
 1880 Deen, William M.
 1881 Davies, H. B.

Fellows.

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| 1881 Docharty, Augustus T. (L. F.) | 1882 Emerson, J. W. |
| 1881 Dowd, William. | 1882 Emmons, John. |
| 1882 Dunham, George H. | 1882 Earle, Joseph P. (L. F.) |
| 1882 Dunlap, Robert. (L. F.) | 1883 Eno, Amos F. |
| 1883 Demorest, W. J. | 1883 Eyre, Maynard C. |
| 1883 Donnell, E. J. (L. F.) | 1883 Earl, Wm. M. |
| 1883 Decker, Jos. S. | 1883 Emmanuel, J. M. |
| 1884 Davis, Howland. | 1885 Elmore, Hon. J. Federico. |
| 1884 Day, Henry. | 1886 Elliott, S. Lowell. |
| 1884 Donnelly, Francis F. | 1886 Easton, Robt. T. D. |
| 1884 Doane, George W. | 1886 Ellis, Geo. W. |
| 1884 Dodge, Richard J. | 1886 Edwards, Walter. |
| 1884 Dalley, Henry, Jr. | |
| 1884 Douglas, Jas., Jr. | 1854 Field, Cyrus W. (L. F.) |
| 1884 Drake, Jas. M. | 1856 Field, Hon. David Dudley. |
| 1885 Dupré, Ovide. (L. F.) | 1856 Field, B. H. (L. F.) |
| 1885 Dakin, Ed. S. | 1857 Fish, Hon. Hamilton. |
| 1885 De Witt, George G., Jr. | 1860 Field, Rev. H. M. |
| 1886 Daniels, Prof. A. L. | 1864 Faile, Thomas H. |
| 1886 Dix, Morgan, D.D. | 1869 Forsyth, Rev. John. |
| 1886 De Lancey, Ed. F. | 1871 Fliess, Wm. M. |
| 1886 Dayton, Chas. W. | 1873 Freedman, Hon. John J. |
| 1886 Dean, David J. | 1874 Farragut, Loyall. |
| | 1874 Foshay, James W. |
| 1859 Evarts, Hon. William M. | 1874 Fellows, John P. |
| 1864 Evans, Walton W. | 1874 Fleet, Oliver S. |
| 1868 Emmet, Thomas Addis, M.D. | 1874 Fox, Baldwin N. |
| 1874 Eaton, Prof. D. Cady. | 1874 Fox, Austen G. |
| 1875 Ellis, John W. | 1875 Foulke, Rev. Thomas. |
| 1875 Elliott, John. | 1875 Fargo, James C. |
| 1875 Eimer, Charles. | 1875 Fuller, Charles D. |
| 1875 Ely, Richard S. | 1875 Ford, James B. |
| 1875 Eads, Capt. James B., C.E. | 1875 Folsom, George W. |
| 1877 Elderkin, John. | 1876 Fisk, Gen. Clinton B. |
| 1878 Ellis, John, M.D. | 1879 Fellows, John R. |
| 1878 Edson, Hon. Franklin. | 1879 Ferris, Robert M. |
| 1879 Earl, Ferdinand P. | 1880 French, Hon. Stephen B. |
| 1879 Elliott, Samuel. | 1881 Foote, Frederick W. |
| 1880 Eckert, Gen. Thomas T. | 1881 Fearing, William H. |
| 1881 Evans, Silas C. | 1882 Fairbanks, Leland, Jr. |
| 1882 Easton, Nelson S. | 1882 Fellows, Charles H. |
| 1882 Ellis, Wilbur Dixon. | 1883 Fisher, Eustace W., M.D. |
| 1882 Eddy, Ulysses D. | 1884 Fraser, Alfred. |
| 1882 Edinger, August H. | 1884 Ferrer, Fermin. |
| 1882 Edwards, Hon. J. Pierrepont. | 1885 Frank, Elias L. |

- 1885 Freeman, Frank Morgan.
 1886 Fletcher, Austin B.
 1886 Fritsch, Hugo.
 1886 Fitch, Chas. E.
 1886 Flagler, H. M. (L. F.)
 1886 Fiske, A. K.
 1886 Fuller, W. H.
 1886 Fettretch, Joseph.
 1856 Greenwood, Isaac J.
 1857 Greene, John W., M.D. (L. F.)
 1859 Griswold, George. (L. F.)
 1868 Gebhard, Wm. H. (L. F.)
 1868 Gerry, Elbridge T. (L. F.)
 1868 Green, Andrew H.
 1869 Gilbert, Clinton.
 1872 Gerard, James W.
 1872 Grinnell, R. M. (L. F.)
 1873 Gillmore, Gen. Q. A., U.S.A.
 1873 Glaubensklec, Theo. G.
 1874 Green, John. (L. F.)
 1874 Gunther, William Henry.
 1874 Gunther, F. F.
 1874 Gibbs, Theodore K.
 1874 Gottsberger, William S.
 1874 Galpen, Horace.
 1877 Guleke, H. F., M.D.
 1879 Graves, Arthur B. (L. F.)
 1879 Gay, Joseph E.
 1880 Gunning, William J.
 1881 Gallaway, R. M.
 1881 Green, George. (L. F.)
 1881 Giles, John C.
 1881 Grace, Hon. William R. (L. F.)
 1881 Garland, James A.
 1882 Gallaher, S. C.
 1882 Gilbert, William E.
 1882 Gallup, Albert.
 1882 Gardiner, J. Grahame.
 1882 Gade, Frederick W.
 1882 Greenough, John. (L. F.)
 1883 Gottschalk, Felix.
 1883 Goodridge, John C., Jr. (L. F.)
 1885 Glazier, Simon W.
 1885 Gibson, George R.
 1885 Greenleaf, James L.
 1886 Gilder, R. W.
 1886 Gallatin, Frederick.
 1886 Gray, George.
 1886 Grummon, J. Ward.
 1886 Georger, Lewis F.
 1886 Gunther, W. H., Jr.
 1886 Gunther, Franklin L.
 1886 Gunther, Ernest R.
 1886 Griffin, Chas. H.
 1886 Godwin, Parke.
 1886 Goodwin, James J. (L. F.)
 1886 Grant, James.
 1886 Godkin, E. L.
 1856 Hewitt, Hon. Abram S.
 1856 Hunt, Wilson G.
 1859 Havemeyer, John C. (L. F.)
 1864 Hammond, Henry B. (L. F.)
 1868 Huntington, Daniel. (L. F.)
 1868 Hall, Elial F.
 1868 Hadden, John A. (L. F.)
 1868 Hallock, Mrs. Frances.
 1870 Hawkes, Prof. W. Wright.
 1870 Havens, Charles G.
 1870 Harrison, Prof. Thomas F.
 1871 Hamilton, Alexander.
 1871 Hand, Clifford A.
 1872 Hamersley, John W. (L. F.)
 1872 Hawkins, Dexter A.
 1872 Holbrook, Levi.
 1873 Havemeyer, Hon. Theo. A.
 1874 Hancock, Gen. Winfield S.,
 U.S.A.
 1874 Hitchcock, Rev. Roswell D., D.D.
 1874 Havemeyer, Hector C.
 1874 Hogue, Henry L.
 1874 Hoyt, Oliver.
 1874 Hurlbert, Henry A. (L. F.)
 1874 Haydock, George G.
 1874 Haines, John P.
 1874 Hinton, John H., M.D. (L. F.)
 1874 Holbrook, E. F.
 1874 Hoe, Richard M.
 1874 Hendricks, Edmund.

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| 1874 Hendricks, Joshua. | 1886 Hoe, Robert. |
| 1874 Hatch, Rufus. | 1886 Huidekoper, Arthur C. |
| 1874 Huntington, C. P. | 1886 Hoffman, Hon. Jno. T. |
| 1874 Hunter, Capt. Edward, U.S.A. | 1886 Henderson, Harold G. |
| 1874 Hoyt, Harlow M. | 1886 Haldane, W. H. |
| 1875 Houston, Col. D. C., U.S.A. | 1886 Homer, Chas. F. |
| 1875 Hoadley, John C. | 1886 Hoyt, Colgate. |
| 1875 Howland, Meredith. | 1886 Hoffman, Eugene A., D.D. |
| 1875 Hyde, Henry B. | 1886 Holt, Geo. C. |
| 1875 Harper, P. J. A. | 1886 Hawley, E. Judson. |
| 1875 Hazen, Gen. W. B., U.S.A. | 1886 Hildreth, David M. |
| 1875 Harris, Siegmund. | 1886 Hinds, Joseph E. |
| 1875 Hun, Leonard G. | 1886 Hitchcock, Bradford W. |
| 1876 Holt, Henry. | 1886 Hillhouse, Thomas G. |
| 1876 Holman, Frank E. | |
| 1876 Hoes, Wm. M. | 1859 Ireland, John B. |
| 1876 Hatfield, J. B. T. | 1874 Iselin, Adrian, Jr. |
| 1877 Houghton, Prof. Walter R. | 1879 Inman, William H. |
| 1878 Howe, George S. | 1881 Ives, Brayton. (L. F.) |
| 1878 Hermann, Henry. | 1883 Ives, James M. |
| 1878 Hinman, Wm. K. | 1885 Innes, William T. |
| 1878 Hitchcock, Hiram. | 1886 Irving, John Treat. |
| 1879 Hamilton, William G. | |
| 1879 Harris, Col. Robert. | 1852 Jay, Hon. John. (L. F.) |
| 1880 Hall, Hayden H. | 1852 Jones, John D. (L. F.) |
| 1880 Hickox, Charles R. | 1868 Johnson, Hezron A. |
| 1881 Hinman, Russell. | 1871 Jones, Walter R. T. |
| 1881 Hoffman, Charles B. | 1874 Judson, Wm. D. |
| 1881 Hamilton, Robert Ray. | 1874 Janssen, Gerhard. |
| 1882 Hascall, Theodore F. | 1874 Jesup, M. K. (L. F.) |
| 1882 Higginson, James J. | 1874 Jaffray, Edward S. |
| 1882 Hawk, William S. | 1874 Jenkins, Wm. L. |
| 1883 Houston, Theodore. | 1874 James, D. Willis. |
| 1883 Hotchkiss, Horace L. | 1874 Jameson, Joseph A. |
| 1883 Henry, Charles I. | 1874 Jordan, Conrad N. |
| 1883 Hebert, Henry B. | 1874 Jaffray, Robert. |
| 1883 Howell, George R. | 1878 Jones, George H. |
| 1883 Hyde, E. Francis. | 1879 Jay, William. |
| 1883 Hurry, Edmund Abdy. (L. F.) | 1880 Jewett, George L. |
| 1883 Hoyt, Alfred M. (L. F.) | 1881 Jewett, Hugh J. |
| 1883 Hendricks, Arthur T. | 1881 Johnson, Bradish, Jr. |
| 1885 Hubbard, Walter. | 1882 Jasper, John. |
| 1885 Hewson, J. H. | 1883 Judson, A. M. |
| 1885 Hodges, N. D. C. | 1883 Jacobs, Abraham L. |
| 1885 Henry, Edward L. | 1885 Juilliard, A. D. |

- 1886 Jones, Walter Mott.
 1886 Janeway, Henry L.
 1886 Jacobi, A., M.D.
 1886 Jennings, O. B.
 1886 Jackson, Samuel M.
 1886 Janvrin, J. E., M.D.

 1854 Kennedy, Robert Lenox.
 1869 Kelly, Eugene.
 1870 Kühne, Frederick.
 1872 Kendrick, Col. H. L., U.S.A.
 1873 Kennan, George.
 1874 King, Edward.
 1874 Kearny, Joseph R.
 1874 Kunhardt, Henry R.
 1874 Kingsland, Wm. M. (L. F.)
 1874 Kalbfleisch, Charles H.
 1874 Keck, Thomas.
 1876 Knauth, Percival. (L. F.)
 1877 King, Clarence. (L. F.)
 1878 Kernochan, James Lorillard.
 (L. F.)
 1879 Kane, S. Nicholson.
 1880 Keene, James R. (L. F.)
 1881 Kennedy, John S. (L. F.)
 1881 Kane, Grenville. (L. F.)
 1881 Kirsch, Louis.
 1882 King, Le Roy.
 1882 King, George Gordon.
 1882 King, John S.
 1882 King, Vincent C. (L. F.)
 1883 Kneeland, Henry T.
 1883 Klutschak, Henry W.
 1883 Knapp, S. P.
 1883 Kohn, Julius A.
 1883 Kerr, Walter.
 1883 King, D. H., Jr.
 1884 Kountze, Augustus. (L. F.)
 1884 Kahn, Dr. Herman.
 1885 Keane, Joseph.
 1885 Knapp, Samuel T., Jr.
 1885 Keppler, Rudolph. (L. F.)
 1886 Kurtz, William.
 1886 Kendall, Ed. H.
 1886 Kidder, Camillus G. (L. F.)

 1886 Karner, W. J.

 1852 Livingston, Cambridge. (L. F.)
 1857 Low, A. A.
 1859 Lathers, Richard. (L. F.)
 1868 Lawrence, Abraham R.
 1869 Lawrence, John S. (L. F.)
 1870 Loew, Hon. Frederick W.
 1870 Lyman, Edward H. R.
 1871 Letson, Robert S.
 1871 Larremore, Hon. Richard L.
 1872 Libbey, William. (L. F.)
 1874 Lauterbach, Edward.
 1874 Livingston, Robert J. (L. F.)
 1874 Langdon, Walter. (L. F.)
 1874 Lorillard, Pierre.
 1874 Lorillard, George L.
 1874 Livingston, Robert E.
 1874 Littlejohn, James.
 1874 Lawton, Walter E.
 1874 Lawrence, Joseph B.
 1874 Le Comte, Joseph.
 1874 Lewis, Walter H.
 1874 Lawson, Leonidas M.
 1874 Leshner, Stephen R.
 1875 Low, Hon. Seth.
 1875 Lawrence, George N.
 1876 Low, A. Augustus.
 1877 Lockwood, Le Grand.
 1877 Latrobe, John H. B.
 1878 Loubat, J. F., LL.D. (L. F.)
 1878 Leon, Nestor Ponce de.
 1879 Levy, Augustus H.
 1880 Lang, Alexander.
 1880 Lee, William H.
 1881 Libbey, Prof. William, Jr. (L. F.)
 1881 Langdon, Woodbury G. (L. F.)
 1881 Little, Joseph J. (L. F.)
 1881 Livermore, Edwin R.
 1881 Lee, J. Bowers.
 1882 Lambert, Edward.
 1882 Langdon, Woodbury.
 1882 Lamont, Lansing.
 1882 Ladd, William F.
 1882 Le Roy, Herman R.

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| 1882 Lapham, Lewis H. | 1875 Monheimer, Joseph A. |
| 1882 Lamborn, Robert H. | 1875 Magoun, George C. |
| 1883 Lourie, J. | 1875 Maclay, Moses B. |
| 1883 Lummis, William. | 1875 Martin, Bradley. (L. F.) |
| 1883 Lounsbery, R. P. | 1875 Meyer, L. H. |
| 1884 Ludlam, George P. | 1875 McLanahan, Geo. William. |
| 1885 Lawrence, Fredk. N. | 1876 Mitchell, W. Howard. |
| 1886 Leete, C. H. | 1877 Matsell, George W. |
| 1886 Ludington, C. H. (L. F.) | 1878 Merrick, William H. |
| 1886 Lee, Wm. H. L. | 1878 Musgrave, Thomas B. (L. F.) |
| | 1878 Mason, Lieut. T. B. M., U.S.N.
(L. F.) |
| 1852 Myers, Col. T. Bailey. (L. F.) | 1879 Marshall, William I. |
| 1853 Moore, George H. (L. F.) | 1879 Mather, Frederick E. |
| 1856 Monroe, Ebenezer. | 1879 Motz, Ferdinand. |
| 1859 MacMullen, Prof. John. | 1879 Miller, John Bleecker. |
| 1859 Morrell, Wm. H. (L. F.) | 1879 Monteith, James. |
| 1859 Moore, Frank. (L. F.) | 1880 Mills, D. O. (L. F.) |
| 1863 May, Lewis. | 1880 Massey, Wm. M. |
| 1863 Moore, W. H. H. (L. F.) | 1882 Marquand, John P. |
| 1864 Morton, Hon. Levi P. (L. F.) | 1882 Marsh, Caleb P. |
| 1868 Morrison, Henry. | 1882 Middleton, Austin D. |
| 1868 Martin, Isaac P. | 1882 McWilliam, John. |
| 1868 Marquand, Henry G. (L. F.) | 1882 Moore, W. T. |
| 1868 Marsh, Hon. Luther R. | 1882 Mead, Erastus F. |
| 1869 Moore, Henderson. | 1882 Markoe, F. H., M.D. (L. F.) |
| 1870 Marbury, Francis F. | 1882 McElrath, Thomas. |
| 1870 Miles, Edward D. | 1883 Marvel, William D. |
| 1872 Meyer, F. William. | 1883 McKay, Donald. (L. F.) |
| 1872 Matthews, Edward. (L. F.) | 1883 McCreery, James. (L. F.) |
| 1872 Marié, Peter. (L. F.) | 1883 Morgan, E. D. |
| 1873 Moore, C. B. | 1883 Mali, Charles. |
| 1874 Morris, Henry L. | 1884 Moore, Joseph, Jr. (L. F.) |
| 1874 Mailler, W. H. | 1884 Myers, Andrew G. |
| 1874 Marble, Manton. | 1884 Macdona, H. |
| 1874 Morrison, Edward. | 1885 Mackenzie, D. E. |
| 1874 Morgan, W. F. | 1885 Morison, George S. |
| 1874 Moir, James. | 1886 Muñoz, J. M. (L. F.) |
| 1874 Morgan, J. Pierpont. (L. F.) | 1886 Murray, James B. |
| 1874 Myers, John K. | 1886 Moore, John G. |
| 1874 McAlpine, David H. | 1886 Moses, Raphael J. |
| 1874 Merrill, William J. (L. F.) | 1886 Manierre, Charles E. |
| 1874 Moulton, Clarence F. | 1886 Miner, H. C. |
| 1875 Mitchell, Edward. | 1886 Meyer, Christopher. |
| 1875 Macy, Arthur, C. E. | 1886 Macklin, John J. |
| 1875 Marcus, Arnold. | |

- 1886 Morgan, N. Denison.
 1873 Neilson, Frederic.
 1874 Newell, John. (L. F.)
 1874 Niles, William W.
 1875 Northrop, A. L.
 1880 Nelson, William.
 1882 Nesbit, John L.
 1882 Naylor, Joseph.
 1882 Nelson, Richard.
 1883 Noble, Charles C. (L. F.)
 1884 Neumoegen, B.
 1884 Newberry, Dr. John S.
 1885 Nelson, George Francis.
 1886 Neilson, James.
 1886 Notman, John.
 1886 Neftel, W. B., M.D. (L. F.)
 1874 Ottendorfer, Oswald. (L. F.)
 1874 Osgood, Franklin.
 1874 Olyphant, Robert M.
 1874 Owen, Frederick N.
 1875 Otterbourg, Marcus.
 1875 Ottiwell, John D.
 1875 O'Connor, Thomas H. (L. F.)
 1875 Opdyke, William S. (L. F.)
 1876 Olmstead, Dwight H.
 1877 O'Gorman, Hon. Richard.
 1879 O'Gorman, Richard, Jr.
 1879 O'Brien, Thomas S.
 1880 O'Shaughnessy, John W. (L. F.)
 1881 Oakley, Henry A.
 1882 Osborn, W. H. (L. F.)
 1882 Oppenheim, Ed. L.
 1882 Osgood, William H.
 1882 Otis, Col. Charles G.
 1883 O'Donohue, Jos. J.
 1884 Orton, Dr. Samuel H.
 1886 O'Brien, Morgan J.
 1852 Poor, Henry V. (L. F.)
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 1882 Parsons, Charles.
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 1884 Place, George.

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 1881 Rhineland, Frederick W.
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 1882 Ray, James D.
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 1885 Rowland, George.
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 1886 Rogers, Belden J.

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 1870 Schafer, Samuel M.
 1870 Schafer, Simon.
 1870 Seligman, James.
 1870 Seligman, Jesse.
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- 1873 Sturges, Frederick.
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 1875 Sibley, Gen. Henry H., U.S.A.
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 1876 Smith, Harsen H.
 1876 Sibley, Hiram W.
 1876 Spaulding, Henry F.
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 1877 Shearman, William P.
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 1877 Sanger, Major Joseph P., U.S.A.
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 1878 Scott, James.
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 1878 Sanford, A. Wright.
 1878 Sands, William R.
 1878 Smith, S. Newton.
 1878 Sabla, Theodore de Joly de.
 1879 Stone, R. C.
 1879 Speir, Francis, Jr.
 1879 Stevens, Frederick W. (L. F.)
 1879 Smith, E. Reul. (L. F.)
 1879 Shields, Prof. Charles W.
 1879 Stetson, Francis Lynde.
 1879 Squires, Grant.
 1880 Southwick, Henry K.
 1880 Suydam, John R., Jr.
 1880 Stark, L. J. N.
 1881 Stone, Joseph F.
 1882 Sass, Dr. Louis F.
 1882 Schuyler, Spencer D. (L. F.)
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 1882 Scribner, Charles.
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 1883 Smith, Henry N.
 1883 Stern, Louis.
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 1883 Scott, Rufus L.
 1883 Sorzano, Julio F.
 1883 Stout, Joseph S.
 1883 Spicer, Elihu, Jr. (L. F.)
 1884 Schley, J. Montfort, M.D.
 1884 Schwatka, F.

- 1884 Shannon, Robert H.
 1884 Stokes, James.
 1885 Storer, Albert.
 1885 Sturgis, Russell.
 1885 Sachs, Julius.
 1885 Slote, Henry L.
 1885 Stanton, S. Franklin.
 1885 Storm, Walton.
 1885 Schmelzel, Wm. R.
 1886 Stevens, Rev. C. Ellis.
 1886 Sherman, Prof. O. T.
 1886 Sherman, George.
 1886 Schuyler, Geo. L.
 1886 Sandford, Lieut. James C., U.S.A.
 1886 Starr, Egbert.
 1886 Satterlee, F. Le Roy, M.D.
 1886 Sturgis, F. R., M.D.
 1886 Smith, Edwin B.
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 1883 Terry, Edmund.
 1884 Taltaval, Wm. A.
 1884 Turner, J. Spencer.
 1884 Thoron, Joseph.
 1885 Tone, T. Wolfe.
 1885 Tiffany, Rev. C. C.
 1885 Turnure, Lawrence.
 1886 Thorne, Jonathan.
 1884 Utter, Dr. Francis A.
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 1868 Taylor, Douglas.
 1868 Tilden, Hon. Samuel J.
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 1870 Thompson, James.
 1872 Tower, Gen. Z. B., U.S.A.
 1874 Thompson, David G. (L. F.)
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 1874 Trevor, John B.
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 1875 Taintor, Charles M.
 1875 Terry, Gen. Alfred H., U.S.A.
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 1875 Terbell, Henry S.
 1876 Totten, Lieut. George Mansfield, U.S.N.
 1876 Terry, Rev. Roderick.
 1877 Tillinghast, William H.
 1878 Talcott, James. (L. F.)
 1879 Thomson, J. P.
 1879 Turnbull, Robert J.
 1880 Tailer, William H.
 1881 Thompson, R. H.
 1854 Viele, Gen. Egbert L.
 1868 Van Santvoord, C.
 1869 Vanderpoel, Aaron J.
 1870 Van Brunt, Hon. Charles H. (L. F.)
 1874 Van Rensselaer, Kilian.
 1875 Vance, Samuel B. H.
 1875 Van Buren, John D.
 1875 Valentine, Lawson.
 1875 Von Post, H. C. (L. F.)
 1875 Vanderpoel, A. Ernest.
 1876 Van Hoesen, Hon. George M.
 1876 Van Brunt, Cornelius.
 1877 Vanderbilt, Cornelius.
 1878 Vanderbilt, William K. (L. F.)
 1880 Von Hesse, Christian.
 1880 Van Alen, Gen. James H.
 1881 Vantine, A. A.
 1882 Vail, M. M.
 1883 Valentine, Daniel K.
 1883 Van Sinderen, Adrian.
 1884 Van Siclen, Geo. W.
 1885 Valentine, Henry C.
 1886 Valenzuela, Enrique.

- 1854 Webb, William H.
 1854 Witthaus, G. H. (L. F.)
 1859 Ward, George Cabot. (L. F.)
 1866 Wendell, Jacob.
 1868 White, Alexander M.
 1869 Weber, Leonard, M.D.
 1870 Webster, Sidney.
 1870 Wilson, Gen. Jas. Grant. (L. F.)
 1870 Wright, E. Kellogg.
 1870 Ward, T. W.
 1872 Wetmore, Wm. Boerum. (L. F.)
 1872 Williams, Stephen C. (L. F.)
 1872 Wells, Jacob.
 1873 Wiener, Joseph, M.D. (L. F.)
 1874 Weyman, Charles S.
 1874 Waite, Chief-Justice M. R.
 1874 Wheeler, Everett P.
 1874 Wadsworth, Julius.
 1874 Wetmore, Hon. George P. (L. F.)
 1874 Wilder, Hon. Marshall P.
 1874 Walraven, Ira E.
 1875 Work, J. Henry.
 1875 Wheeler, John V.
 1875 White, Charles Trumbull.
 1875 Wilcox, Franklin A.
 1875 White, David.
 1875 Winslow, Gen. Edward F.
 1875 Whitehead, Comdr. Wm., U.S.N.
 1875 White, Loomis L.
 1876 Wedemeyer, A. J. D.
 1877 Ward, W. S.
 1877 Waters, James T.
 1877 Woodruff, Col. D., U.S.A.
 1878 Whitehead, Henry M.
 1878 Whittemore, Charles.
 1879 Watson, Francis A. (L. F.)
 1879 Wolfe, Miss Catherine. (L. F.)
 1881 Wilson, James.
 1881 Wilson, John.
 1881 Whitehouse, Frederic Cope.
 1882 Welch, Uriah.
 1882 Watson, Frederick.
 1882 Wadsworth, John H.
 1882 Willis, Hon. Benjamin A. (L. F.)
 1882 Waddingham, Wilson. (L. F.)
 1882 Williams, Francis W.
 1882 Williams, John L.
 1882 Williams, David. (L. F.)
 1882 Winthrop, Robert. (L. F.)
 1882 Wheeler, Ezra.
 1883 Wilson, Richard T.
 1883 Wilson, Theodore.
 1884 Wheelwright, Wm. D.
 1884 Watson, George H. (L. F.)
 1884 Wood, Wm. H. S.
 1884 Wolcott, Joseph C.
 1886 Wright, Wm. Phillips.
 1886 Walsh, Richard M. L.
 1886 White, S. V. (L. F.)
 1886 Wiman, Erastus.
 1886 Walker, John A.
 1886 Willets, Edward B.
 1886 Whitehouse, J. H.
 1886 White, Horace.
 1886 Wales, Salem H.
 1886 Watson, Wm. P.
 1886 Ward, John E.
 1874 Young, Mason.
 1875 Zollikoffer, Oscar.
 1884 Zabriskie, Andrew C. (L. F.)
 1886 Zucker, Alfred.

 FELLOWS DECEASED, 1886.

- | | |
|-----------------------|---------------------|
| Arnold, Richard. | Dennis, Charles. |
| Ceballos, J. M. | Evans, Walton W. |
| Coddington, Thomas B. | Forsyth, Rev. John. |
| Crocker, Wm. Baylies. | Fox, Baldwin, N. |

Hancock, Gen. W. S.
Hawkins, Dexter A.
Hoadley, John C.
Hoe, Richard M.
Learned, Edward.
Lorillard, George L.
McClure, George.
Redmond, James Morton.

Rose, Theodore.
Scudder, Henry J.
Stone, Joseph F.
Tilden, Hon. S. J.
Van Alen, Gen. James H.
Wilder, Hon. Marshall P.
Willis, Hon. Benjamin A.

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Pim, Capt. Bedford.

Seymour, Hon. Horatio.
Stevens, Henry, LL.D.

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Revue Coloniale Internationale, Amsterdam.
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PURCHASES.

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Charts, 79 in all : Islands of the Pacific, Straits of Juan de Fuca, Azores, Bay of Avatcha, Entrance to the Pei-Ho, Behring's Strait, The Amakirima Group, Loo-Choo Islands. Japan, Korea, Low Archipelago, Caldera Bay, Mindanao, The Antarctic Continent, George's Bank, Brazil, North Pacific Ocean, Newfoundland, Labrador, Brindisi, South America W. Coast, Rio de la Plata, Davis Strait, Ecuador, China, Straits west of New Guinea, Pelew Group, St. Vincent, South Pacific Ocean, Sendai Bay, Japan, Indian Ocean, Magellan Strait, Mediterranean, Siberia, Alaska, St. Paul River

Liberia, Brava Harbor E. Africa, Wrangel Island, St. Thomas Harbor ; Chart of La Guayra ; Chart of Harbor of St. Thomas ; Chart of Tenacatita and Navidad Bays ; Chart of Pisco Bay ; Chart of San Juan del Sur, Nicaragua ; Chart of East Part of Bahama Islands, with Cuba ; Charts of the North Atlantic Ocean ; Charts of Port Hamilton ; Island of Cuba ; Port of Bahia, Brazil ; Pilot Charts of the North Atlantic Ocean ; Chart of N. Coast of Brazil, Maraca Island to Parahyba Harbor ; Pilot Chart of the North Atlantic, April, 1886 ; Chart of Coast of the U. S. from Cape Canaveral to Havana, 1886 ; Chart of the Virgin Passage with St. Thomas and Adjacent Islands ; Chart of the Atlantic Coast of the United States, Halifax to New York, with Southern Part of Nova Scotia ; Chart of Cartagena Harbor, U. States of Colombia ; Catalogue of Charts, Plans, Sailing Directions, and Other Publications of the U. S. Hydrographic Office to January, 1886, Washington ; Pilot Chart of the North Atlantic for May, 1886 ; Chart of the Coast of Brazil, Mouth of the Amazon and Vicinity, Maraca Island to São João Island ; Chart of the Mediterranean Sea, 3 sheets ; Chart of the Gulf of Fonseca, Central America ; Pilot Chart of the North Atlantic for June, 1886 ; Chart of Island of Santo Domingo, with Mona Passage ; Chart of Coast of Peru, Ancon Bay ; Chart of Gulf of Fonseca, West Coast of Cent. America ; Chart of the N. E. Coast of Yucatan, Progreso to Belize ; Pilot Chart of the North Atlantic for July, 1886 ; Chart of Port Cispata, U. S. of Colombia ; The African Pilot, Part III. ; Gen. Ex. of the Atlantic, No. 22 ; Sailing Directions, for the English Channel, June 10th ; Coasts and Islands of the Mediterranean, April 17th ; Coast of South America, June 30th ; Navigation of the Atlantic, June 30th ; West Coast of Africa, March 1st ; West Coast of Africa, June 30th ; West Coast of Africa, January 30th ; Coast of Chili, Bolivia, and Peru, June 30th ; Bay of Biscay, June 30th ; Caribbean Sea and Gulf, June 30th ; Pilot Chart of the N. Atlantic for August, 1886 ; Chart of Avatoru Pass and Anchorage ; Chart of Port Carreto, Colombia ; Chart of Port Cispata, Colombia ; Chart of Corsarios Bay, Venezuela ; Chart of Candelaria Bay, Colombia ; Chart Cumaná Anchorage, Venezuela ; Pilot Chart of the N. Atlantic for September, 1886 ; Chart of Bahia Honda, Colombia ; Chart of N. E. Brazil, Parahyba River to Pernambuco ; Indian Ocean, General Examination ; English Channel,

Part 2, No. 35 ; Coasts and Islands of the Mediterranean, Part I, No. 37 ; Coasts and Islands of the Mediterranean, Part II., No. 38 ; Azores, No. 50 ; Madeira, Salvages, No. 51 ; Cape Verde, No. 53 ; Coasts and Islands of the Mediterranean, No. 68 ; Kattegat Sound, No. 70 ; Pilot Chart for N. Atlantic, October, 1886 ; Pilot Chart for N. Atlantic, November, 1886 ; Great Circle Sailing Chart of the North Atlantic ; Chart of Tampico Harbor, Mexico ; Chart of Crooked Island Anchorage ; Chart of the Rio de la Plata ; Chart of Puerto Cabello ; Pilot Chart of the N. Atlantic for December, 1886 ; Chart from Ocosingo River to San Juan del Sur ; Chart of Turk's Islands ; Chart of Anegada Passage ; Chart of Hong Kong.
From Library of the Navy Department, Washington :

Report of Lieut. G. B. Harber, U. S. N., of His Search for the Missing People of the Jeannette Expedition ; Report of the Surgeon-General of the Navy, 1884, Washington, 1885 ; Report of Exhibits at the Crystal Palace Electrical Exhibition, 1882, Washington, 1883 ; Report of the British Naval and Military Operations in Egypt (Part I., text ; Part II., plates), Washington, 1883 ; Report of the Gun-Foundry Board for 1884, Washington, 1885 ; Naval Professional Papers : No. 13, Magnetism ; No. 14, Steel ; No. 15, Ships, Guns, and Armor ; No. 16, Engines, Boilers, and Torpedo Boats ; No. 17, Magnetism of Iron and Steel Ships ; No. 18, Training of Enlisted Men ; No. 20, Naval Brigade and Operations Ashore, Washington, 1883-1885 ; Report of Secretary of the Navy, Washington, 1885 ; General Information Series : No. III., Examples, Conclusions, and Maxims of Modern Naval Tactics, Washington, 1884 ; No. IV., Papers on Naval Operations during the Year Ending July, 1885, Washington, 1885 ; Report on Comparative Merits of Anthracite and Bituminous Coal, Washington, 1885 ; Ships of War, 1885, by Francis T. Bowles, Assistant Naval Constructor, U. S. Navy, New York, 1885 ; Register of Commissioned and Warrant Officers of the Navy of the United States, January 1, 1886, Washington, 1886 ; Papers on Squadrons of Evolutions, June, 1886 ; Report on European Dockyards, by Naval Constructor Philip Hichborn, U. S. N., Washington, 1885 ; U. S. Naval Uniform Regulations, Washington, 1886 ; Report of the Secretary of the Navy for 1886, Washington, 1886.

From the Smithsonian Institution :

Report of the Smithsonian Institution for 1884, Washington.

From the Department of Agriculture :

Report on Area of Winter Grain, Condition of Farm Animals, etc., April, 1886 ; Spring Wheat and Cotton, June, 1886.

From J. W. Powell, Director of the U. S. Geological Survey :

Mineral Resources of the United States, 1883-1884, by Albert Williams, Jr., Washington, 1885 ; Bulletins of the U. S. Geological Survey, Nos. 15-23, Washington, 1885 ; Fifth Annual Report of the Director of the U. S. Geological Survey, 1883-1884, Washington, 1885 ; Map of the United States, 73 sheets ; U. S. Geological Survey, Bulletins Nos. 1-29.

From the Department of State, Washington :

Foreign Relations of the United States, 1885 and 1886 ; Reports of Consuls of the United States, Nos. 58-70, 1885 and 1886 ; Report of the Electrical Conference at Philadelphia, September, 1884, Washington, 1886.

From the Bureau of Navigation, Washington :

American Ephemeris and Nautical Almanac for 1889, Washington, 1886.

From the Engineer Department, U. S. A. :

Tables of Geographic Positions, Azimuths, and Distances, Together with Lists of Barometric Altitudes, Magnetic Declinations, and Itineraries of Important Routes, Prepared Principally by Lieut. M. M. Macomb, Washington, 1885 ; Annual Report Chief of Engineers, U. S. A., 1885, 4 vols., Washington, 1885 ; Third International Geographical Congress, at Venice, in 1881, Report by Capt. Geo. M. Wheeler, Washington, 1885.

From the Department of the Interior, Washington :

Report on the Tenth Census, 3 vols., Washington ; The Mining Laws of the United States, Washington, 1886 ; Education in Alaska, Washington, 1886.

From the Chief Signal Officer, Washington :

International Simultaneous Meteorological Observations, 1881, 1882, 1883, 1884, 1885 (Monthly), Washington ; International Meteorological Observations (Daily) from Jan., 1881, to June, 1884 (1,277 Nos.), Washington ; Reports of Chief Signal Officer for the Years 1873 to 1878, 1882, and 1883, Washington ; Signal-Service Notes I-XX, XXII. and XXIII., Washington, 1882-1885 ; Professional Papers of the Signal Service, Nos. 1-7 and 14, Washington ; Tri-Daily Charts, Jan. 6, 1886, to Jan. 10, 1886.

From the U. S. Land Office, Washington :

Maps of Alabama, Arizona, California, Colorado, Dakota, Florida, Idaho, Indian Territory, Illinois, Iowa, Kansas, Minnesota, Mississippi, Montana, Nebraska, Oregon, Utah, Washington, Wisconsin, Wyoming.

From the Director of the Mint, Philadelphia :

Annual Report of the Director for the year ending June 30, 1884, Washington ; Tables and Methods for Ascertaining the Weight and Coinage Value of Gold and Silver and the Ounces at Standard Finesness Contained in Bullion from .000 $\frac{1}{2}$ to 1.000 Fine, Prepared by Horatio Burchard, Washington, 1885.

From the Bureau of Education, Washington :

Circulars of Information, Washington ; Report of Commissioner, 1883-84, Washington, 1885 ; Special Report, Expositions and Conventions at World's Fair, New Orleans, Pt. I. Catalogue of Exhibits, Washington, 1886.

PART I.

TRANSACTIONS

OF THE

SOCIETY FOR THE YEAR 1886.

TRANSACTIONS OF THE SOCIETY FOR 1886.

Annual Meeting of the American Geographical Society, held at Chickering Hall, Tuesday, January 12, 1886, at 8 o'clock, P.M.

Ex-Chief-Justice DALY, President, took the chair.

It was voted, on motion, to dispense with the reading of the minutes of the previous meeting.

The following gentlemen were elected Fellows of the Society :

Austin B. Fletcher, Walter Mott Jones, S. Lowell Elliot, C. H. Leete, John R. Abney.

Mr. John Bartholomew, of Edinburgh, was elected a Corresponding Member.

The annual report of the Treasurer, Mr. Walter R. T. Jones, was read by Mr. W. H. H. Moore. The report showed a cash balance of \$357.73. It was accepted and ordered to be placed on file.

The annual report of the Council was then read, as follows :

NEW YORK, January 12, 1886.

Since the last annual report seven regular meetings of the Society, and six regular and two special meetings of the Council, have been held.

At the annual meeting, January 13, 1885, Prof. F. H. Cushing delivered a lecture entitled "The Discovery of Zuñi, or the Ancient Province of Cibola and the Seven Lost Cities."

On the 26th of February, the Hon. David Dudley Field read a lecture on the "Nomenclature of Cities and Towns in the United States."

On the 19th of March, Mr. Ernest Ingersoll delivered a lecture with the title "How the Settlement of North America has Affected its Wild Animals."

On the 11th of April, a lecture was read by the Hon. J. W. Hoyt, Ex-Governor of Wyoming, on "Wyoming: Its Resources and Wonders."

On the 28th of May, a lecture was delivered by the Hon. Eugene Schuyler, on "The Turcomans and the Russian Advance."

On the 13th of November, Mr. William Bradford read a paper on "Life and Scenery in the Far North."

On the 14th of December, the Hon. S. G. W. Benjamin, ex-U. S. Minister to Persia, delivered a lecture entitled "Persia and the Persians."

Most of these lectures were illustrated with stereopticon views.

The annual report of the Treasurer shows a balance in the treasury of \$357.73.

The publications of the Society have been regularly distributed to its Fellows and Honorary Members, and to the societies with which we exchange.

The Library and Map-Rooms have been enriched by many valuable publications; the additions for the year amounting to 3,485, including books, charts, maps, and atlases.

WILLIAM REMSEN,

Chairman of Council.

The Committee on Nominations presented the following report :
To the American Geographical Society :

The Nominating Committee appointed to select officers to fill vacancies, under resolution of the Society passed at its meeting, December 12, 1884, respectfully report the selection of the following nominees for election in accordance with Chapter V., Section 2, of the By-Laws :

For President—Charles P. Daly, LL.D., term to expire January, 1887.

For Vice-President—Roswell D. Hitchcock, D.D., term to expire January, 1889.

For Recording Secretary—Elial F. Hall, term to expire January, 1889.

For Treasurer—Walter R. T. Jones, term to expire January, 1887.

For Councillors—T. Bailey Myers, Chandler Robbins, Egbert

L. Viele, Theodore W. Dwight, Joseph W. Drexel, terms to expire January, 1889.

(Signed) BENJ. H. FIELD,
HENRY W. DUNSHEE,
JOHN D. JONES,

Nominating Committee.

NEW YORK, January 8, 1886.

On motion, the report was adopted, and the Society proceeded to a ballot, which resulted in the unanimous election of the nominees.

The President then introduced to the meeting Mr. Ernest Ingersoll, who delivered an address entitled "Mountaineering in British America."

On motion, the Society adjourned.

(Signed) ELIAL F. HALL,
Recording Secretary.

Meeting of February 10, 1886, held at Chickering Hall.

Ex-Chief-Justice DALY presided.

The Society, on motion, voted to dispense with the reading of the minutes of the last meeting.

The following gentlemen were duly elected Fellows of the Society :

Henry C. Carter, Harvey Baker.

Gen. G. W. Cullum offered the following resolutions, which were duly seconded and, on motion, unanimously adopted :

"WHEREAS, No accurate map of the State of New York exists, and none is possible without a complete trigonometric survey of the State ; and

"WHEREAS, Such a map is urgently needed by the people of the State, and by all its great interests ; be it

"*Resolved*, That this Society, having full confidence in the scientific correctness and value of the work already accomplished by the New York State Survey, and recognizing the economy and fidelity with which it has been performed, deprecates and regrets the suspension of the Survey ;

"*Resolved*, That the American Geographical Society desires the resumption of the Survey under such continuous management as will exclude from its direction all mere political considerations ;

"*Resolved*, That the records of the State Survey should be printed for preservation ;

"*Resolved*, That a certified copy of these resolutions be transmitted to the Governor and to each branch of the Legislature."

The President then introduced the speaker of the evening, Dr. B. B. Simmons, for twenty-five years a resident of Japan, and Medical Adviser to the Japanese Government, and head of the National Hospital at Yokohama. Dr. Simmons read a lecture on "The Social Status of the Women of Japan."

On motion, the Society adjourned.

Meeting of March 18, 1886, held at Chickering Hall.

Gen. GEO. W. CULLUM, Vice-President, in the chair.

It was voted, on motion duly seconded, to dispense with the reading of the minutes of the last meeting.

The following gentlemen were elected Fellows of the Society :

P. C. Barker, M.D., Robert Hoe, Prof. C. G. Rockwood, Hon. Jonathan Chace, Verplanck Colvin, J. Remsen Bishop, Hugo Fritsch, Prof. A. L. Daniels, Wm. Phillips Wright, W. J. Kerstetter.

Gen. Cullum then introduced the speaker of the evening, Gen. R. E. Colston, formerly of the Egyptian Army, who delivered a lecture on "The War in the Soudan for the Rescue of Gordon."

On motion, the Society adjourned.

Meeting of April 12, 1886, held at Chickering Hall.

Hon. CHAS. P. DALY, President, took the chair.

The reading of the minutes of the previous meeting was dispensed with, on motion duly made.

The following gentlemen were elected Fellows of the Society :

R. W. Gilder, C. C. Clarke, Arthur C. Huidekoper, Henry L. Janeway, S. G. W. Benjamin, ex-Minister to Persia.

Judge Daly then introduced to the Society Dr. Landau, a distinguished scientific traveller, recently arrived in New York, on his way to Berlin from a visit to the Philippine Islands.

Dr. Landau expressed his sense of the honor done to him, and the President then introduced the speaker of the evening, Mr. James Douglas, Jr., who delivered an address on "The Lines of Trans-continental Railway in America and their Geographical Features."

On motion, the Society adjourned.

Meeting of October 8, 1886, held at Chickering Hall. •

Ex-Chief-Justice DALY presided.

On motion, it was voted to dispense with the reading of the minutes of the last meeting.

The following gentlemen were elected Fellows of the Society :

James Neilson, Rev. C. Ellis Stevens, Enrique Valenzuela, R. M. Raymond, E. C. Bridgman, J. Charles Davis, Rev. Morgan Dix, D.D., Rev. J. M. Buckley, D.D., Charles E. Fitch, Hon. Addison Brown.

The President then announced that the Council had effected a lease of the property of the Society on the Boulevard between 150th and 151st Streets, subject to the approval of the Society, and Mr. W. H. H. Moore then offered the following resolutions :

The Council of the American Geographical Society take great pleasure in announcing to the members that they have leased the property of the Society, situated on the Boulevard between 150th and 151st Streets, for a term of twenty-one (21) years from the first of November, 1886, for a gross rental of eighty-six thousand seven hundred and fifty (\$86,750) dollars, with the privilege of two renewals (the taxes and repairs to be paid for by the lessee), and have given the lessees an option to purchase said property for ninety thousand (\$90,000) dollars, provided said option be exercised within ten years.

The Council authorized the making of certain necessary repairs incurring an expense of nearly three thousand five hundred (\$3,500) dollars, and desire that their action should be approved by the members of the Society : they therefore beg leave, in accordance with Section 6, Chapter XIV. of the By-laws, to offer the following resolutions :

"Resolved, That the Society hereby ratifies and approves the action of the Council in leasing to the Hebrew Sheltering Guardian Society the property on the Boulevard between 150th and 151st Streets for the term of twenty-one (21) years from November 1, 1886, at a gross rental of eighty-six thousand seven hundred and fifty (\$86,750) dollars, with the privilege of two renewals ;

"Resolved, That the Society further approves the action of the Council in granting to the lessees the privilege of purchasing said property for ninety thousand (\$90,000) dollars ; and the President,

with the Recording Secretary, or with the Treasurer of this Society, is hereby authorized to execute in the name of this Society such deeds or papers as may be necessary to convey said property should said Hebrew Sheltering Guardian Society exercise the option of purchase within the period fixed ;

"Resolved, That the action of the Council, in authorizing repairs to be made to the building on the premises so leased, be and it is in all things approved."

The motion being put, and duly seconded, the resolutions were adopted by a unanimous vote.

Judge Daly then announced that a paper would be read on the "Nicaragua Canal," and briefly reviewed the consistent record of the Society with regard to this route of interoceanic communication.

He paid a tribute of respect to the high qualities and the achievements of Capt. Bedford Pim, of the Royal Navy, whose death was reported by telegraph from London ; and then introduced to the Society the speaker of the evening, Commander H. C. Taylor, of the U. S. Navy, whose paper on the "Nicaragua Canal," in its scientific, commercial, and political aspects, was listened to with marked attention.

A vote of thanks to Commander Taylor and a request for a copy of his address for the archives of the Society were moved by Mr. F. A. Stout and unanimously passed.

On motion, the Society adjourned.

Meeting of November 18, 1886, held at Chickering Hall.

Gen. GEO. W. CULLUM, Vice-President of the Society, in the chair.

It was voted, on motion, to dispense with the reading of the minutes of the last meeting.

The following gentlemen were elected Fellows of the Society :

George B. Roys, H. M. Flagler, R. Percy Alden, Alexander Agassiz, Richard L. M. Walsh, Chas. H. Ludington, John G. Moore, William Kurtz, J. M. Muñoz, John T. Hoffman, John Notman, Phillips Phoenix, E. L. Godkin.

Count Napoléon Ney, member of the Society of Commercial Geography of Paris, was elected a Corresponding Member.

Gen. Cullum then introduced to the Society the Rev. G. E. Ellis,

President of the Massachusetts Historical Society, who delivered a lecture on the "Hudson Bay Company, 1670-1870."

Judge Daly, at the close of the lecture, expressed the pleasure with which the Society had listened to the address, and recalled his meeting, thirty-five years before, at St. Paul, Minnesota, with a party of half-breeds, descendants of Lord Selkirk's colonists on Red River. These half-breeds spoke English with a strong Scotch accent.

On motion offered by Judge Daly, the thanks of the Society were voted to Dr. Ellis for his paper, and a copy was requested for the records.

On motion, the Society then adjourned.

Meeting of December 22, 1886, held at Chickering Hall.

Ex-Chief-Justice DALY, President, took the chair.

On motion, it was voted to dispense with the reading of the minutes of the last meeting.

Judge Daly stated that the call made upon the members to increase the number of Fellows upon the roll had resulted, within a few days, in the addition of one hundred and twenty-one names, which had been passed upon by the Council. The names were then read by Mr. Harlow M. Hoyt, and on motion were declared accepted, as follows :

J. A. Bostwick, Life Fellow ; Isaac L. Rice, Life Fellow ; John E. Ward, Life Fellow ; S. V. White, Life Fellow ; J. W. Christopher, Morgan J. O'Brien, Charles Slover Allen, M.D., James B. Murray, C. Wylls Betts, Henry V. Allen, Birdseye Blakeman, Clarence R. Conger, Edward D. Bettens, Edwin B. Smith, Hugh N. Camp, Frederick Gallatin, Alexander Bliss, Camillus G. Kidder, Abraham Jacobi, M.D., Raphael J. Moses, Jr., Eugene A. Hoffman, D.D., Wm. G. Peckham, Colgate Hoyt, John M. Bowers, J. Wells Champney, Edward Coffin, Jr., Stephen G. Clarke, John Bowne, Harold G. Henderson, Bradford W. Hitchcock, John Treat Irving, W. A. Purinton, George C. Holt, E. L. Corthell, George Calder, J. Bayard Backus, Elihu Chauncey, Robert T. B. Easton, A. K. Fiske, Rev. Robt. Collyer, D.D., Thos. G. Hillhouse, Wm. Henry Haldane, Wm. B. Neftel, M.D., W. H. Fuller, Edward L. Parris, F. R. Sturgis, M.D., Richard M. Bruns, F. S. Bradford, M.D., Howard Crosby, D.D., Geo. W. Ellis, George Gray, Edward F. De Lancey, J. E. Janvrin, M.D., James J. Goodwin, Edward H. Kendall, H. G. Pearson, D. J. Dean,

Rastus S. Ransom, Jonathan Thorne, W. H. L. Lee, Salem H. Wales, E. Judson Hawley, George L. Schuyler, W. J. Karner, W. H. Gunther, Jr., E. Jeroloman Carroll, Charles H. Griffin, Charles B. Cornell, Edward J. Berwind, John A. Affleck, Christopher Meyer, Edward F. Beddall, Lieut. Jas. C. Sandford. U.S.A., O. B. Jennings, Henry C. Cooke, Egbert Starr, Erastus Wiman, Louis F. Georger, John J. Macklin, Charles E. Smith, T. W. Pearsall, Charles W. Dayton, Alanson Cary, Thomas L. Snead, Walter Edwards, N. Denison Morgan, Ernest R. Gunther, Joseph Fettretch, James Grant, Charles E. Manierre, John A. Walker, Rush E. Avery, George H. Pings, Col. T. L. Casey, U.S.A., Chas. F. Homer, Frank S. Bond, Prof. O. T. Sherman, Parke Godwin, Horace White, Franklin L. Gunther, L. M. Hooper, David M. Hildreth, M. C. Bouvier, John Beattie, Belden J. Rogers, Joseph E. Hinds, Edward B. Willets, Henry N. Babcock, Benjamin S. Church, F. Le Roy Satterlee, M.D., Wm. P. Watson, Henry Clay Miner, J. H. Whitehouse, Alfred Zucker, George Sherman, J. Ward Grummon, John Foster Nevins, James McFarland, Charles W. Drake, Charles Pryer, Samuel M. Jackson.

Mr. W. H. H. Moore then offered the following resolution, which was unanimously adopted :

Resolved, That a committee of three be appointed by the President to select suitable candidates for officers of the Society to be elected (pursuant to Section 2 of Chapter V., of the By-Laws) at the annual meeting to be held on the 11th day of January next, and to make their report to the Society at that time."

The President named as the committee :

Nathaniel P. Bailey, *Chairman*, Clinton Roosevelt, Henry W. Dunshee.

The President then stated that the famous English scientist, Alfred Russel Wallace, who shares with Darwin the honor of having worked out the theory of evolution, would deliver an address at the annual meeting in January.

He then introduced to the Society the speaker of the evening, Prof. F. A. Ober, known for his ornithological collections, made in the Caribbee Islands, under the auspices of the Smithsonian Institution.

Prof. Ober delivered a lecture on "Florida and the West Indies"; and, on motion, the Society adjourned.

PART II.

PAPERS READ

BEFORE

THE SOCIETY DURING 1886.

Note.—THE AUTHORS ALONE ARE RESPONSIBLE FOR THE CONTENTS OF
THEIR RESPECTIVE PAPERS.

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MOUNTAINEERING IN BRITISH COLUMBIA.

BY

ERNEST INGERSOLL.

The Rocky mountains have become rapidly known of late, yet not a little misapprehension seems to remain in regard to them. The term is the name of a system—not a single chain; or rather, it is both, for while the whole system is called “the Rocky mountains,” the irregular parts of the line of greater elevations which together form the continental watershed, are often termed the Rockies in distinction from neighboring ranges and spurs.

Every one knows the position of this system as the first uplift westward of the great plains, and that beyond it lie the arid basins of Utah and Idaho, and the interior plateaus of British Columbia.

The Rockies may be said to begin in northern New Mexico, and they almost at once attain their greatest elevation, for the loftiest peaks of the whole system belong to southern Colorado. The word “range” does not express the form of these mountains, generally speaking, at all. The Rockies cover a whole country, populous with mountains. “It is as if an ocean of molten granite had been caught in instant petrification when its billows were rolling heaven-high.”

Nevertheless, popular language divides the system into certain great lines. Thus a “Main” or “Snowy” range is recognized in Colorado, meaning the continental watershed there, but this so breaks up and ramifies in the

central part of the state, that it is only by seeking the headwaters of the separated streams, that one can trace this spiny backbone of the continent. Eastward of it stand the splendid lines of the Sangre-de-Cristo and Front ranges, upholding loftier peaks than those of the main chain itself. Westward a wide area is filled with vast uplifts, standing in isolated groups, serving as cross-links, or lying parallel with the general north-and-south lines of great elevation.

Such are the Rocky mountains in Colorado. Along the northern line of that state and Utah they break down, and the sage desert reaches far eastward to meet the plains on the plateau of South Pass. Here is a broad depression, through which conveniently passes the Union Pacific railway; and to cross the country by this route, in the hope of enjoying a view of the Rockies, will lead to disappointment, since an unsatisfactory glimpse of a few far-away peaks, behind some dreary foothills, is all that is possible to the traveller. If a tourist wants a fair sight of the Rockies from a railway train, he must choose some other route than that of the Union Pacific!

North of South Pass the system is resumed in a single chain stretching northward to the Yellowstone National Park. The park is at a centre of elevation. Groups of lofty and broken heights radiate in every direction, out of which chaos two great ranks, the Main Range and the Bitter Root mountains, extend northwestward beyond the United States, rising resplendent in British Columbia in the three noble mountain ranges, hitherto almost unknown, which it will be my pleasure to describe to you to-night.

The vast system we have traced has been steadily trending westward. Pike's Peak, in Colorado, is on the 105th meridian; the Yellowstone Park is near the 110th; while the eastern foot of the Rockies at Calgary, is on the 117th. In other words, the main "Divide" sweeps northwestward from the longitude of Denver in southern Colorado to that of Salt Lake City, at the Canadian boundary,—a westing of five or six hundred miles; and this continues until the whole system sinks out of sight on the coast of Alaska.

It had been my fortune to explore every part of this system within the United States; and when, during the summer of 1885, opportunity was offered me to traverse the less known Rockies of British America I gladly availed myself of it. What sights awaited me I could get little idea of, for of the very few persons who had been there none retained coolness enough to do more than exclaim at the stunning majesty and the bewildering beauty which had overcome their senses.

The month was August. My route was from Toronto up the lakes to Thunder Bay, thence by rail to Winnipeg, and so on across the glorious Canadian plains to the foot of the mountains at Calgary—a town about one hundred and fifty miles north of the boundary.

When one has travelled day after day across these seemingly endless opens, he searches the horizon eagerly for the first glimpse of the mountains. "I strained my eyes," writes Fitz Hugh Ludlow, that brilliant genius whose eyes were too soon closed in the grave, "in the direction of the driver's pointing finger, but for a minute could see nothing. Presently sight became adjusted to a new

focus, and out against a bright sky dawned slowly the undefined shimmering trace of something a little bluer. Still it seemed nothing tangible. It might have passed for a vapor effect of the horizon, had not the driver called it otherwise. Another minute and it took slightly more certain shape. It cannot be described by any eastern analogy; no other far mountain view that I ever saw is at all like it. . . . It is impossible to imagine them built of earth, rock, any thing terrestrial; to fancy them cloven by horrible chasms, or shaggy with giant woods. They are made out of the air and the sunshine which show them. Nature has dipped her pencil in the faintest solution of ultra-marine, and drawn it once across the western sky with a hand tender as Love's. Then when sight becomes still better adjusted, you find the most delicate division taking place in this pale blot of beauty, near its upper edge. It is rimmed with a mere thread of opaline and crystalline light. For a moment it sways before you and is confused. But your eagerness grows steadier, you see plainer, and know that you are looking on the everlasting snow, the ice that never melts."

My first sight of these Canadian Rockies was caught at a station called Gleichen, quite one hundred miles away from the lace-like touches of white, just at the horizon, which denoted their topmost pinnacles; and after that we became all attention to see them grow distinct and real, and to watch their majestic outlines slowly emerge from the cobalt-blue silhouette into which distance turns the whole range.

The profile of the easternmost or front range, seen from Calgary, is extremely irregular. There is no stately line of rounded summits set in orderly array, nor an evenly

serrated chain of peaks; but the sky rests upon a jagged wall, every elevation having some angular and abrupt form quite unlike its neighbor, and the whole seeming a long stretch of ruins, rather than a mountain range which apparently has been less harmed by the "tooth of time" than any other in the West. As we ascend the turbulent Bow river, passing through its narrow portals into a long lateral valley, we begin to understand this jaggedness of profile. These are not granite ridges such as rise with easy sloping into the massive domes about Pike's or Fremont's peaks, nor the cones characterizing volcanic areas like the Sierra San Juan. They are tremendous uplifts of stratified rocks, as old as the Devonian and Coal ages, which have been broken out of the crust of the earth and heaved aloft. Some sections, miles and miles in breadth, thousands of feet thick, have been pushed straight up, so that their strata lie as level as before, their tops are plateau-like, and their sides drop nearly vertically. Others have fallen partly over, have sunken, sideways, or are broken into colossal fragments; or, heated to plasticity, have been bent and crumpled by prodigious pressure, laterally exerted. All this chaos looks cataclysmal, and it is hard to believe it of slow production.

Now all this angular grandeur of outline is intensified by the great quantity of snow and ice borne winter and summer upon their naked and chilling heads. In winter the snows pile themselves unceasingly upon the crests and promontories, collect in the half-crushed forests that essay to climb the upper slopes, alight in clinging drifts upon every ledge and projection up and down the cliffs, and pack into the cañons until tall trees are hidden, and knoll and pit, river-bed and gravel-ridge are all as one.

But by and by an insidious stream eats its way into the base of some smooth incline of snow draping a steep front; or too ponderous a burden is heaped by some careless cloud upon the top; or the spring sun fires his arrows into an unguarded point; and so the weakened under flakes let go. There is no catching again! The whole mass begins to move downward—very slowly at first. But every inch of progress breaks some new fastening and the impetus grows. A few moments—seconds perhaps—suffice to set the whole broad, thick mass of snow sliding forward with crushing swiftness and power. The speed increases. The snow is rolled over and over, condensed into huge spheres, tossed into clouds of crystal dust—packed together by the pressure of its resistless descent; until with an echoing roar, reverberated from a hundred heights, the thunderous volumes crash downward to the mountain's foot, sweeping a clean path.

Thus with ever-shifting form and hue the mountains rise swiftly into glory and large suggestiveness, until, almost before we know it, we attain the foot of the great central chain, and begin the ascent of the pass itself, leaving the Bow river and turning to the left up one of its tributaries.

Now we come close underneath the snows which have been guiding us for a hundred miles. The massive heights that dominate the world around us are loaded with it, though it is late midsummer. Snow is heaped upon their backs, sprinkled upon their brows, traces in emphatic lines the stratification-ledges and every furrow upon their aged faces! In each gorge between the headlands hangs a long white stole over the green-gray of the mountain's robe, its fringe lost among the trees; but when such gorges are at

the very summit they often end at the brink of a cliff a couple of thousand feet high, and there the snow which half fills them must break off squarely, adding its thickness of five or six hundred feet to the height of the cliff, or, perhaps, overhanging it in a mighty cowl that some day will topple with an echoing shock into the abyss. In an alcove between Mt. Lefroy and Mt. Goodsit, nearly opposite Laggan, and again on the western side of the range, such snow-faces may be seen, one above the other like marble terraces.

The snow in the under part of these shady gorges must be what in the Swiss Alps is termed *névé*—that is, compressed by its weight into a hardness almost equal to ice. But there is no lack of real ice. The whitish-green of the Bow river, and the milky torrent we are now following, tell of the glacial origin of both these streams, and as we approach the picturesque park in which the station Laggan is situated the great mer-de-glace whence they flow, bursts into view. It is an enormous plateau of ice lifted upon the top of the range, and walled in by yellow cliffs—lonely parapets whose bases are hidden in ice, and whose crests are forever beaten by frigid blasts. This glacier is perhaps unequalled in area by any of those we shall see farther on, since it extends backward far beyond the part visible; yet it is only a remnant of the ancient glacier which once filled this whole long valley-trough, and plowed out the easy gap we are entering by. The distance to it is something like twenty-five miles, and its height about 1,500 feet above the track; but to reach it would be a most laborious and time-consuming task.

The marvellous transparency of the air here bewilders the calculations of the novice in attempting to reckon

distances or estimate altitude. The wildest guesses are made, and fruitless strength is expended in trying to walk to points which look close at hand, but are really many a mile away. Those who have had experience in the more southerly Rockies are deceived into overestimating heights, judging by the snow, through forgetting how much farther north they now are. Hoary heads, like these that confront us now, would mean thirteen or fourteen thousand feet, at the very least, in the Sierra San Juan; here they can count only ten or eleven. The magnitude of the objects looked at, again, is deceptive, for unconsciously we subject them to the familiar rules of perspective governing the smaller landscapes we are used to; and it is only by the aid of telescopes, and after much experience that we realize the distance and vast size of such features of the scene as this mer-de-glace, or an isolated freak like the Devil's Head.

Along this glacier-fed river, and through the foothills generally, lives an Indian tribe of Assiniboine stock called Stonies, who are fine-looking fellows, good hunters, and good fighters. They came there within a generation or two, and never go out upon the plains, nor far into the mountains. The Hudson's Bay Company some years ago set up a trading station at the mouth of Kananáskas creek, which came to be called the Old Bow Fort, and was the southernmost post of the Hudson's Bay Company in the Rocky-mountain region. Traders speak highly of the good character of these Stonies, who were of considerable help to the mounted police during the Riel rebellion, going against their old enemies the Half-breeds with whole-souled fury. Except these foothill Indians, however, there is little or no humanity in the

scenery of this or the more western ranges of the Columbian Rockies. I am often asked to describe the people there, and the way men live. There are no people! The human voice was never heard in these mountains until, only three years ago, railway men and miners penetrated their fastnesses; and these adventurers dwell nowhere except at the few railway stations, upon what the cars bring to them; so there is nothing to say about people there. Nor will the time ever arrive, perhaps, when human occupation will have any injurious effect upon the savage originality of that scenery.

Though the mountains here seem tall and grand enough in all conscience, and have a sublimity not easily equalled among any even loftier ranges south, yet the whole mass of the Rocky-mountain system north of the boundary must be spoken of as depressed, since its greatest peaks do not much exceed eleven thousand feet above the sea, and none of its passes are over half that, while, on the contrary, the central ranges in the United States often reach fourteen thousand feet and upwards. Several fair passes cross the front range between the parallels 49° and 53°. The southernmost one, much used formerly by the buffalo-hunting Indians, leads over into the Kootenay valley. The next are Crow's Nest and Vermilion passes, then the one in which the Kananáskas takes its rise; after that the Kicking Horse, or railway pass, which we have reached by the ascent of the Bow river, and so on, until, under latitude 53°, we come to the Yellowhead or Athabasca pass. Many of the principal peaks in this range were long ago named by the botanist Douglas, or else by Dr. Hector, after prominent Englishmen of science,—Balfour, Forbes, Hooker, and others.

But while I make these digressive comments, you must remember that we are winding and climbing up a narrow stream-gorge, which will presently bring us into the very presence of the monarchs of the range. It is not a fearful journey. The railway attempts few acrobatic feats. Once indeed, it leaps the cataracts pouring through a short cañon, but then the extraordinary beauty of the emerald and white water tossed from side to side of the deep and gloomy chasm, the circle of snowy heights above, the broad overlook of forested foothills down the pass, so enchant the eye as to make the most nervous one forget his timidity. What room is there for any feeling save awe and wondering admiration at such pictures as the eye receives here, when we attain to higher and higher standpoints, and rank beyond rank of purple and crimson peaks, cloaked in snow and studded with ice, rise into our ken across a broad, rolling intervene of forest and crag!

Behold these two in which the range culminates—The Cathedral and Mt. Stephen! The former is poised upon a vast hilltop, as it were, of fallen débris, which has buried the base of the crags under long brown slopes; but far above these slopes—far above the last misshapen spruce—buttressed by cliffs, beneath which the clouds form for their long flight plainsward, stands the mighty summit whose partial ruin has left it gloriously picturesque in fallen wall, spire, pinnacle, and crumbling battlement. Gazing at this stupendous example of nature's stonework, Gothic in every feature, one doubts whether it is true that a tree gave the suggestion of that form of architecture; and conceives of it as growing out of an attempt by mountaineers to imitate the noble fea-

tures into which frost, lightning, and running water carve the rocks that point to heaven.

We move slowly past the splendid façade of The Cathedral, surprised, at each advancing step, by some new arch, toppling tower, or shining pediment of snow. Next opens to view an amphitheatre of snow, almost filling a half-circle of peaks in the rear. One horn of this crescent is The Cathedral. The other is Mt. Stephen, mounted upon a Titanic pedestal, whose pier-like masonry rises three thousand feet almost sheer above our heads.

Mt. Stephen is as noble as the central spire of the British Rockies ought to be! It commands the clustered heights about it, and can be seen from far and near. So precipitous is the evenly stratified front, suggesting a pyramid cloven in twain, that it shows a naked face of black crag clear to its apex, marked only by the lines of snow lodged precariously upon its strata-ledges.

But sweeping backward from this frightful precipice-brink, close under the sky, are wide fields of unblemished snow, the abode of eternal silence and solitude. Now and then a venturesome wild goat may cross a spur to nibble the sweeter grass in some sheltered nook beyond; or a ptarmigan may whirl in rapid flight along its skirt; or the golden eagle, resting upon his pinions while the globe revolves beneath him, may scan its glistening wastes; but otherwise the imagination has free scope upon those snowfields to draw pictures fearless of contradiction, for no man has ever surveyed their extent or probed their depth.

In the midst of those vast snows behind Mt. Stephen, one of the greatest of the glaciers rests—one which descends from unknown beginnings to the verge of a cliff

said to be two thousand feet high. It has never been my good fortune to see it well. Where there is so much snow, evaporation under the summer sun is incessant; and as this evaporation is almost immediately condensed by the chilled air, rolling, wind-tossed, and very beautiful clouds often linger about the snow-banks, above which black peaks emerge at intervals into the sparkling ether as the royals of a man-of-war overtop the lower canvas. In midsummer, too, the sunshine eats the surface of the glaciers, making them whitish and rounded. But in the cool autumn, when little moisture arises, and the concealing snows have not yet fallen, there is visible, where this glacier breaks at the brink of the cliff, a solid front of blue ice, upon which the sunlight plays in prismatic hues marvellous to behold.

Down from these reservoirs comes tumbling a torrent,—flashing through the funereal spruces and ringing upon the rocks. It seems not only to be fed by snow, but filled with its crystals—it is too white for a gliding fluid! Thus romantically springs into existence the Kicking Horse, which gives its name to the pass, and which we shall follow down to the great Columbia.

The track lies well up upon the shoulder of Mt. Stephen, whose crags topple over us on the left. On the right falls steeply away the forest-grown declivities of the gorge, separating us from bristling heights northward. Down in the bottom of this dark, rough ravine, beset with cañon-walls, crossed by innumerable ledges, hindered everywhere among fallen blocks and driftwood, the Kicking Horse rushes headlong with the speed of continuous leaping. There is no pause for it anywhere—no smallest space of quiet water—no color of blue or

green or gray, like another stream. All is snowy, sudsy foam, for every atom of it is filled with air; and the long streamers of snow trailing from the loftiest peaks are not so white as this flashing falchion of foam, cleaving its way through the black rocks and sombre woods.

For fifty miles we followed the stream to its exit, from the westernmost foothills of the range. The scenery is the same as before—and it is different. You look off to the right and left upon range after range and peak overtopping peak in blue and iron-gray and white. You think there can be nothing finer—nothing more stately; that rock and ice and snow, forest and torrent, cannot find grander expression. Then suddenly you emerge upon some bridge spanning a dizzy chasm, or wheel cautiously around a wooded headland (creeping always towards the foot of the great range), when, behold! some more noble combination—some loftier aspect—some new and sublimer phase of Alpine scenery. And, at last, you emerge upon the forested flood-plain of the Upper Columbia.

Presuming again upon the remoteness of this region, some explanation of the local geography may not be out of place.

Broken and group-like in Montana, the Rocky mountains north of the Boundary are arranged in three parallel serrations. The easternmost of these, which we have just crossed, is the continuation of the great cordillera, bordering the plains, and stretching from the sources of the Missouri to those of the Yukon. It is called The Rockies, proper, and its eastern face presents a bold and unencumbered front, but its western flank breaks into a jumble of spurs and annexed ranges, out of which the Kootenay river flows southward.

Close to the sources of the Kootenay lie the reservoirs of the mighty Columbia, which find their outlet northward in a powerful stream that pours through a series of gorges along the western base of the Rockies until it has passed the 52d parallel, nearly two hundred miles north-west of its starting-point. Then the mountains upon its left break down, and the Columbia, turning sharply round their head, moves straight southward to Oregon. Stretching north and south for two hundred miles within this great elbow of the Upper Columbia stand the magnificent Selkirks—

“——where they purely lift
Snows that have never wasted, in a sky
Which hath no stain.”

The course of the Columbia after it has turned southward around the head of the Selkirks is beset with lofty walls on both sides, as before, since west of the river rises a third gigantic upheaval designated the Gold range. The engineer of any transcontinental railway across southern Canada found opposed to him, therefore, before he could enter British Columbia, the three enormous mountain ranges I have mentioned—the Rockies, the Selkirks, and the Gold range; and two crossings of the broad and swift Columbia river. To have overcome these obstacles in the marvellously short time allowed, is one of the most notable feats in the history of railway construction.

The original route of the Canadian Pacific was intended to pass up the Saskatchewan, traverse the Rockies through Yellowhead pass, far to the northward, and follow westward through British Columbia by the old trappers' trail down Thompson river, cut out by McKenzie and the Hudson's Bay Company's people a century or more ago.

But at the last moment judgment was given in favor of the route we have followed through Kicking Horse pass, and thence across the Selkirks by the way of the Beaver and Illecillewet rivers. The railway had been built to the summit of the Selkirks at the time of my visit—although only two years before that no human foot, savage or civilized, had ever penetrated their fastnesses; and it was rapidly approaching from the west. Two months later (November, 1885) the junction was effected, as you are aware, making these glorious mountains accessible to the public by a through route from Quebec to Victoria, or, more largely speaking, from London to Yokohama. But a large part of my explorations were made afoot or on horseback, in advance of this completion.

The first sight of the Selkirks from the eastern bank of the Columbia is alluring enough. The afternoon sun is dropping slowly toward it, and the mists of the broad valley rise into light clouds that fleecily veil the rugged outlines. In the golden glow which permeates the atmosphere these kings lay aside the sceptre of power and extend the hand of grace. Their snows sparkle rosily. We catch gleams of blue ice, like the flashing of jewels in a crown, the massive forms are enlarged and glorified with a marvellous transparency of color, and the rich, dark olive of the forest falling away at their feet forms a royal robe of velvet, whereon the warmer lines of close shrubbery sprouting upon the tracks of old snowslides serve as an exquisite trimming. The beauty of such mountains, beyond such a foreground, transfigured in the suffused color that saturates the vesper light, is not to be measured in words, or transferred to canvas, or even well appreciated by the senses, until it has

lain awhile in the receptive memory and been absorbed by the heart.

The gorge of the Beaver river, through which the railway climbs the eastern flank of the Selkirks, is especially noteworthy for its waterfalls, and for its bridge—the highest wooden bridge in the world,—which carries the track across Stony creek, two hundred and ninety-five feet above the water! It is not until the summit of the range is nearly gained, nevertheless, that the full meaning of the pass is revealed.

With sturdy force the locomotive toils up the sloping track, dragging the cars sullenly in and out of many curves. The V-shaped channel of a slender creek is far down at the left; verdure-hidden steeps overhang on the right. Suddenly we find our pathway hemmed in by enormous walls of rock. That on the left is Mount Carroll, whose mighty promontory rises straight up so vertical and tall, and from a base so near us, that it cuts away half the sky and seems to reach to the very zenith. How high is it really? I do not know—five or six thousand feet to the snow plumes on its icy casque; but exact figures do not concern us. Its Titanic front swings aloft in a noble curve that at the top seems to sway and tremble, and we feel rather than coldly measure, the grandeur of form, richness of color, and dignity of pose it expresses.

Next, attention is diverted by the roar of a cataract, which comes down, heavy and steamlike, from an invisible reservoir. Glacier creek is its name, and a few minutes later we can trace its upper course—a series of shining cataracts, leaping from ledge to ledge down through the trees for two or three thousand feet. Then we get away from the woods and attain the summit—a green

pit within that circle of peaks that hid so jealously the entrance to their citadel, 5,000 feet above the sea; and here, in the rear of the citadel-wall, as it were, one can understand far better than from the outside, the massiveness and power which the Selkirks express, by their breadth and solidity and burden-bearing strength.

To the eastward, for example, is what is called The Amphitheatre. It is a semicircle of splintered battlements—a combing curved along the crest of the range, braced by stanchions of glittering bronze and divided into upright triangles by slanting chasms, white with treasures of unmelted snow. Enclosed in the circle of this parapet, rests a plain of ice, curving downward, cornucopia-like, from an unseen head. This vast and beautiful glacier has an area of several miles, and in August was gray with decay, fallen rocks, and the powdering of recent storms. Streaks, patches, and marblings of vivid blue (in some lights green) could always be detected, however, where the solid ice was exposed in some crevasse or on a worn surface; and the whole sight was irresistibly attractive to the eye.

I could not contrive the time to climb to this glacier, which is about 3,000 feet above the pass. Prof. John Macoun, of Ottawa, whom I met here in search of alpine plants, had done so, and gave me an account of it. He says that in its upper part it seems to grind against the very bases of the cliffs and to rest upon a floor of solid rock, and that a border of undermined fragments, which have fallen from the imminent crags, strews its edges and is carried along in its progress. Toward its foot, however, the ice is narrower than the amphitheatre in which it rests, and between the ice and the wall lie old lateral

moraines, thinly overgrown with flowers. The glacier's foot was found to be some distance back from where it once had been, and its former terminal moraine was not well marked. The ice was several hundred feet thick along its front, and gashed by deep furrows where streams of water poured over, while Glacier creek, whose snowy cascades had excited our admiration, issued from underneath the *mer-de-glace* out of a huge vault of clear blue ice. The foot of this glacier is, approximately, 7,350 feet above tide water; yet it is overlooked by Carroll's and several other peaks.

A little to the westward of The Amphitheatre is another much smaller glacier, which Macoun also visited, and found to have retreated some one hundred and fifty feet from its former limit. It is an easy matter to climb from the railway up to this latter ice-field; but to pass around the cliffs some two miles to the greater one is a tiresome and somewhat perilous undertaking.

I remarked to Professor Macoun, what I have already suggested in this lecture, that the process of destruction in these mountains had never gone on rapidly, nor proceeded very far, in my opinion, and that now it had practically ceased, to which he replied that his much broader observation confirmed this view, and added that, not only the highest slopes of smooth hillside, but the tali at the base of the cliffs, were more or less covered with low plants, and bore only a trifling amount of freshly fallen material. This is in very striking contrast to the incessant disintegration and levelling going on in some of the ranges of Colorado, which I have described in my "*Crest of the Continent*" (p. 150 *et seq.*); yet I know no reason why the Selkirks should enjoy their immunity, unless it

may be that the climate of the north is less subject to rapid fluctuations and extremes of heat and cold than that of the south, for I doubt whether the rocks here are much tougher.

A whole essay would but hint at the magnificence of The Amphitheatre; yet it constitutes only a small segment of the adamantine girdle with which this summit pass is bound. *I* looked upon the burnished triangles that mark its shivered crest, sitting on the logs of a forest cut only the day before. *You* may enjoy it, when you go there next summer, rocking in easy chairs and surrounded by the luxuries of a city-like hotel, confident of a bed and sure of your dinner, without which scenery is a vanity and the glories of color and form are as naught.

The railway begins its descent upon the western side around a series of loops, some nine miles in length, supported upon trestles of extraordinary length and height. The head of one of these loops passes close to the front of another glacier, which is the largest of all those to be seen in the Selkirks, and should be honored with the name of Louis Agassiz. This glacier is most easily reached of all, and, hence, is most likely, in the future, to be visited and talked about by tourists, who can find upon it all the excitement of real Alpine travel. It is only about a thousand feet above the level of the rails, and after a trail has been cut through the exceedingly thick woods in the ravine there will be little or no difficulty in reaching it. I see no reason why, in a few years, the exploration of these ice-sheets, with the ascent of the terrific heights that environ them, should not be as much objects of adventurous ambition as to perform a similar achievement in the Swiss or Tyrolese Alps. I predict

that this will be the case; and he who goes earliest will have the highest reward in novelty of experience.

When the sun is just past noon there creeps out upon this glacier a triangular shadow miles in width. It is the shadow of Syndicate Peak—a superb prism shooting its slender apex far above all its royal mates, and cleaving clouds that have swept unhindered over their heads. The poise and self-sustaining splendor of this snow-striped peak—a landmark for soaring eagles from the Saskatchewan to the Fraser—the culmination and pride of the Selkirks—is worthy the pen of some master of words and idolater of mountains like John Ruskin. In all pictures of the Selkirk mountains, in their western aspect, it stands pre-eminent—a sublime centre-piece!

From the summit of the Selkirks to the second crossing of the Columbia, on their western side, the distance is seventy-five miles. All of this space lies in the rugged valley of the Illecillewet, which spelling, I am told, is a corruption of En-cil-wháit-k—words in a dialect of the Kalispelm language, which might be translated “swift-current.”

The Illecillewet is a turbulent mountain stream, of no great size, occupying a valley, sometimes of considerable width, everywhere filled with that remarkable forest for which British Columbia is famous. The great size of the trees attracts attention when the eastern ascent of the Selkirks begins; but it is only after the summit has been passed that their full development is encountered. The principal species are the Douglas spruce or “Oregon pine” (*Pseudotsuga*), the white “cedar” (*Thuja*), a hemlock (*Tsuga Mertensiana?*), and Engleman’s spruce (*Picea*). On the bottoms grow scattered poplars, paper

birches, dwarf maples, together with thickets of small willows, and other under-shrubs.

The feature that first impressed me among these trees was not their tallness so much as their multitude, yet I was surrounded by mast-like trunks reaching two hundred and fifty or even three hundred feet straight into the air—as high as the towers of the Brooklyn bridge; and it was, in fact, the bulk of their mighty boles, rather than the number, which made the forest seem so crowded.

The ground underneath such a close thick canopy of foliage is forever shaded and damp, both with ceaseless dews and with the tricklings of the surrounding uplands. Hence there grows an extravagance of mosses, ferns, fungi, moulds, and all plants that love moisture and are not afraid of chills. The soil in the woods is hillocky with moss, burying rocks and earth, as well as mouldering logs and the bases of the trees, under a thick, oozy rug. There are hosts of soft creeping plants, too, and pretty flowers and berries, many of them strange to eastern eyes.

Two details of the botany are particularly noticeable—the horrid “Devil’s club” and the fungi, huge polypori, attached at all heights to the trees, serving as substantial brackets for charming hanging gardens of flowers and trailing vines. The far-famed Devil’s club is a tall plant, bearing large, palmate leaves at the summit of two or three scraggy branches and presenting a very pleasing appearance at a distance. Close contact teaches you that these ugly stems and leaves are studded with horrible spines, sharp as needles, strong as rose-thorns, and twice as numerous as either. Dense jungles of this malicious weed (*Fanax horrida*, I believe) grow as high as one’s head in many places, and make travel in the

woods, where the foot slips at every step over some obstruction or into some pit concealed by the Kidderminster of wet moss, not only a toilsome but a most painful task. Moreover, the prickles are sharp and acrid not only, but barbed as well, so that they work their way into the flesh and make bad sores unless quickly extracted. Altogether the Selkirks possess one of the most picturesque forests to look at, and one of the very worst to travel through on the face of the earth.

In going down, the finest scenery is left behind, and the observer must seek the rear of the train in order to enjoy it. The luminous peaks at the summit, clustered about old Syndicate, group and regroup themselves above the green forest-slopes, as the train turns this way and that on its winding track down the pass, so that you never tire of the kaleidoscopic pictures. Then presently we get down to where the more distant peaks north and south come into view; and here and there we cross a district of snow-slides, or perhaps meet with banks of hardened snow and rubbish, fifty or one hundred feet deep, which have lasted all summer in the bottom of the gorge, arching the noisy torrent, to show where the burden of a mountain-side had been cast down. Wide spaces above these banks appear free of trees, proving that season after season the avalanches sweep them clean; and this feature offered one of the most difficult problems with which the railway builders had to contend.

The western foot of the Selkirks rests upon a wooded river-plain or level valley, several miles in width at this point, through which the Columbia now pursues a devious channel some fifty feet below the general level.

The second crossing of the river occurs at a point

somewhat southeast of Donald, the first crossing, and a town named Farwell has sprung up there, where all the liveliness and license of the extreme frontier were exemplified at the time of my visit. The river here sweeps in a fine bend away toward the base of the Gold range, several of whose grandest peaks, crowned with glaciers, are visible. The current is very swift (some eight miles an hour) and beset by eddies and rapids, yet a steamboat makes regular trips from Farwell down into Idaho—where communication is had with the Northern Pacific railway, at Spokane Falls, by means of wagons.

Immediately opposite Farwell, and only three miles distant, is the entrance to the Eagle pass through the Gold range—the third and westernmost rank of the Rocky-mountain system in this region. Though the range itself is lofty, rugged, and capped with ice and snow in splendid array, this newly found pass is low and easy, and said to be very pretty; but I did not have the time to go up into it, and so on over to the end of the other railway, which would have carried me down through the Fraser cañons to the Pacific; and with a few words about mining prospects I must bring these notes of travel to a close.

Twenty-five years ago, when the placers of California and Montana had begun to fail, there was a rush into British Columbia to work the gold fields discovered away up between parallels 52° and 53°, known as the Fraser and Cariboo diggings. The streams along which these placers lay come from the western slope of these same Gold mountains, and the Cariboo district, northward, still has productive mines, supporting a large population of cattlemen and farmers. Prospectors pushing across the

range soon reported rich placers on its eastern slope at the Big Bend of the Columbia. The usual rush thither followed. Log towns were built and mines opened; but it was found impossible to get provisions enough into that remote region to sustain life, and after untold sufferings, and many and many a death, the last of the adventurers abandoned the place, leaving their cabins to rot down over the machinery, furniture, billiard-tables, and other signs of temporary occupancy which remain hidden in the jungles there to this day.

That was twenty years and more ago. As soon as the railway made the region newly accessible, prospecting for precious metals was resumed, and the outcome has been most gratifying. Many of the placers are about to be reworked, and tunnels are being driven upon veins of quartz rich in both silver and gold—amazingly rich in many instances. Moreover (not to speak of some scattered mining among the metamorphic slates and limestones of the Rockies and Selkirks), many new localities along both sides of this Gold range have been discovered, which promise to yield a profitable return.

The ores here closely resemble those of Idaho, Montana, and Utah. In truth, they ought to. A continuous line of mineral-bearing upheavals may be traced from the Stickeen region of Alaska through the Cariboo country, down the Gold range into the Kootenay district of British Columbia and the Fort Colville and Cœur d'Alène regions of Idaho (always trending easterly), to Montana, Eastern Idaho, the Wahsatch, and so on through Arizona to Mexico. Here, then, is the geological axis of the Rocky mountains, in this Gold range, the least prominent of the British Columbian mountains; while the Sel-

kirks and the Rockies (so-called) are, *structurally* speaking, *foothills*, despite their superior majesty of height and splendor of pose. You will find not a particle of primitive rock in all their breadth—only palæozoic sedimentary rocks, more or less changed by the vicissitudes of heat through which they have passed, since first laid down at the bottom of the carboniferous seas.

Geologically speaking, therefore, the backbone of the continent is here entirely west of the Columbia river, and it is its easternmost foothills which separate the waters of the Atlantic slope from those of the Pacific, and so make the geographical divide. But what superb hills they are!

And now, having by a quiet, matter-of-fact statement, brought you gently down from the heights of rhapsody, in whose thin air I fear you have been kept too long, I regretfully bid you farewell, with many thanks for your company over the mountains.

NOTE.—More extended accounts of these mountains, derived from the trip herein sketched, appear over my signature in *The Field* (of London, England) for December 26, 1885, and January 2 and 16, 1886; and in *Science* (New York), vol. vi., November 27, and December 25, 1885, and vol. vii., March 12, 1886. The publications of the Geological Survey of Canada, and of the Canadian Pacific railway also contain many papers relating to that region and the contiguous plains on both sides.—E. I.

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PERSIA AND THE PERSIANS.

BY

S. G. W. BENJAMIN, EX U. S. MINISTER TO PERSIA.

Your attention is invited to a consideration of some of the leading points of interest in the remote and ancient empire of Persia. Remote as that land appears to us on this side of the Atlantic, and amid the active, energetic scenes in which we live, yet its past history is so inwrought with the march of civilization that all of us are familiar with the name of Persia, and all have the vague idea that it still represents, in concrete form, the customs and the splendor recorded in the magical tales of the "Arabian Nights." The cultivated imagination kindles at the mention of Persia. The names of Cyrus, of Darius, of Xerxes, are household words. Every school-boy has pored over the narrative of the invasion of Greece by the mighty hosts and armaments of Persia. But it is difficult to realize that the nation, founded and ruled by those sovereigns centuries before Christ, is still a living power inspired by a continuous vitality that may suffice to preserve her national independence for ages to come. She had already developed a distinct civilization and an extraordinary genius for political organization before the star of Rome had begun to cast its rays above the horizon of history. The immortal portals of Persepolis were reared ages before the Parthenon of Athens, and are still among the most remarkable rivals of the architectural triumphs of

ancient Greece of which antiquity has left us the remains. Although shorn of some of her vast territorial possessions, which have at various times extended from the Ganges to the Nile, and from the Don to the Indian Ocean, Persia is yet by no means an insignificant power. Her limits include more than the area of France and Germany combined, while the intellectual vigor of her people, after the lapse of nearly three thousand years, shows few signs of degeneracy. It is true that for several generations Persia has occupied comparatively a small portion of the world's attention, and still less influence in its political councils, thus conveying the impression that she is verging on extinction. This is due in part to the prevailing religion, Mohammedanism, which, at the outset, gave a fresh impulse to the nations that embraced that faith; but in the end it has been this very religion which has antagonized the nations of the Orient with the spirit of modern progress initiated by the invention of printing. Another reason for the obscurity into which Persia has fallen is found in the inaccessibility of that country; although not geographically remote, it is enclosed by lofty and almost inaccessible mountains like a Chinese wall. This obstacle was comparatively slight in former ages, when all the world travelled toilsomely on horseback or in sailing ships. But the invention of steam and the difficulty of laying railways to any profit in Persia, owing to the great cost and the thinness of the population, have operated to place her in an eddy at one side of the rush of modern progress.

But at last the turn of Persia has come. No longer can she remain unnoticed and unknown, or continue regardless or independent of what is going on elsewhere.

In spite of herself, in spite of opposing circumstances, she is now looming up into new importance and is becoming the theatre of events destined to be of growing magnitude and weight.

Notwithstanding all that has been written about Persia, the ignorance that still exists about it is so general that there is no absolutely correct map of that country. Until quite recently it was asserted in scientific circles that no fossils existed in its geology. But the fact is that numerous evidences of animal life are now found in the strata of the Persian mountains. I was afforded a curious instance of this ignorance concerning Persia by an English geologist who, in alluding to a scientific lecture on that country, recently heard by him in London, was surprised to learn from me that beds of excellent coal abound in Persia. It is of a bituminous character. The modern discovery of the existence of these coal seams was due to the sagacity of Jenghir Khan, late Minister of Sciences and Arts. There existed a tradition that in early ages the Persians had used mineral coal, and the specific name for it was well known, while all traces of the mines had long been forgotten. As such fuel was a prime necessity for the proper working of the modern machinery of the government arsenal, of which he had charge, Jenghir Khan instituted a diligent search after mineral coal, but without any result. Some time after this, when visiting some lead mines in the heart of the forests of Mazanderan, Jenghir Khan observed that some gypsies encamped in that lonely spot were making fires of a material different from charcoal. On investigation he discovered to his great joy that they were actually burning a fine bituminous coal. But when he inquired where

they found it, they refused to reveal the secret. Neither threats nor rewards availed, and he then placed spies to watch their movements, who eventually succeeded in their efforts. Stimulated by this most valuable discovery, search was repeated elsewhere, and now seams of coal, apparently inexhaustible, are found in several parts of Persia. At Teheran, the capital, it is used for fuel and steam machinery. In Southwestern Persia, near her best ports, the supply of coal is so large that it could very easily be made a very important article of exportation. Lead and iron mines are also found near the coal seams. This is an important fact for the consideration of capitalists, for if ever railways are to be made profitable in Persia, it must be by constructing the rails and rolling stock on the spot.

The present area of Persia is practically divisible into three great parts, distinguished by variety of climate, formation, and products. The west and northwest, comprising the provinces of Azerbaijân, Kurdistan, and Kermanshâh, with minor subdivisions, have a rolling surface that is often broken and mountainous.

The most marked differences are noticeable between the provinces lying north of the great Elburz range and adjacent to the Caspian Sea, and the provinces comprising Central and Southern Persia, which are separated from the former by that range. On the northern side the mountains condense the moisture from the Caspian. Fog, clouds, and rain are frequent. Numerous full-fed streams, abounding in trout and salmon, leap down the gorges of the Elburz and meander across the alluvial slopes that border the sea. This humidity produces a wonderful vegetation. The mule roads wind through a noble

underwood of primeval forests, where the venerable trunks are clothed with the emerald velvet of lush mosses or embraced by the long tendrils of flowering lianas. The green glades opening here and there by the side of the brooks gleam with the scarlet coronal of the pomegranate and the undulating splendor of the wild poppy. Near the sea the woods give place to orchards weighted with fruitage, to vineyards, spacious lawns, and vistas of barley fields, old granges, and thatched huts of the peasantry nestling under superb masses of pendulous foliage by the edge of steaming rice fields, which are lovely to the eye but suggestive of the fever poison that threatens the unwary stranger who exposes himself to the night air.

At Rescht, the chief town and port of this region, the traveller makes preparations for his journey over the mountains to Teheran and Southern Persia. He must go on horseback; if in a hurry he can travel post at the rate of eighty or a hundred miles a day. A special order from the government is essential for this. The stations average four farsākhs,* or sixteen miles apart. On presenting the order to the keeper of the station-house a fresh relay of horses is given the traveller, and after a pipe and a cup of tea from the ever smoking samovar or tea urn, he speeds again on his way at a steady gallop. Of course such a mode of travel is at first very exhausting, and is impossible for the infirm, or for most women. And it is rendered additionally fatiguing because during the greater part of the year one must travel in Persia at night, owing to the heat, and rest in a wretched wayside post-house from eight in the morning

* The farsākh is the same as the parasang of the "Anabasis."

until five in the afternoon. But one soon becomes accustomed to the hardships of *chappá* or post-travelling, and finds something very romantic in scaling dark mountain passes or galloping hour after hour over vast solitary wastes with no company but the silent post-boy and attendants, and the eternal constellations which for untold ages have kept watch over the destinies of that grand old empire.

But if one has luggage and a family with him, or prefers to proceed more leisurely, he engages a cook and other attendants, and a *tachtraván* or litter, borne by mules, for the ladies of his family. A drove of mules is also required, and several *charvadárs*, or muleteers, for the luggage. Then the procession commences its slow, winding way towards the pass that must be scaled in order to reach Teheran. A day's journey will be from twenty to twenty-five miles. On leaving a station, the cook is sent in advance to see that the rooms are swept and a meal prepared against our arrival at the next station. Slowly creeping up to the pass day after day, we become aware that we are entering upon scenery so different, that we seem to have passed into another hemisphere. Forests are left behind; and at the summit of the ridge one looks over plains extending with scarcely an interruption six hundred miles. The atmosphere is likewise changed from moist to dry. One is surprised to find that the descent on the southern side of the Elburz range is more gradual and less profound than on the northern side. This is due to the fact that Central Persia is a vast table-land, elevated from four to six thousand feet above the sea. East, west, and south these remarkable steppes roll away like a great sea, quivering with

mirage, and broken at long intervals by islands of verdure, or gray ridges, which rise above the plain like rocky headlands, until the fading horizon melts into the cloudless sky, where the eagle and the vulture soar alone.

Almost the whole of this vast plateau is dependent upon irrigation for the scanty vegetation, which is limited to a comparatively small portion of its extent. This irrigation is, in turn, dependent upon the snows which cover the lofty ranges that appear at convenient intervals above the plains. The importance of these ranges may be judged of by their altitude, which enables them to retain the snow on their summits during the entire year. The chain of the Elburz is in parts over three thousand feet in height; while its central peak, Mt. Demavend, is not less than twenty-one thousand feet in height. The range of the *Zardakooch*, near Ispahan, has a higher average than the Alps.

The soil of this central plateau is capable in many parts of producing rapid and abundant crops under irrigation, especially in the valleys at the foot of the mountains; some tracts are exceptionally fertile. Wherever there is water, the cereals, opium, tobacco, melons, grapes, figs, and, indeed, every variety of vegetable and fruit may be raised. The melons, quinces, and pomegranates are the finest in the world. The wild flowers of Persia are similar to those of Central Europe, but less various than those of North America. Numerous varieties of the aster and the poppy are perhaps the most prominent features of the flora of Persia. The trees which are found indigenous to the country are the plane or *chendr*, which has always had a mystical character in Persia, and grows to an enormous size, even in dry places,—in the time of

Marco Polo, Persia was sometimes called the Land of the *Arbre Sec*, meaning the plane-tree,—the elm, the poplar, which is greatly cultivated for the wood; the chestnut and the walnut are found in great abundance, also the willow, the sandal-wood tree, and the box-tree. The mulberry of Persia produces the best silk in the world; the pomegranate is so abundant that it grows wild in the forests. In the south of Persia, the date-tree yields large crops; in the southwest there are extensive forests of dwarf oak, but elsewhere the oak is scarce; and one of the singular features of the Persian landscape is the general absence of evergreens. But enormous tracts of Persia, especially in the eastern half of the country, are desolate wastes covered with sand and salt, unprofitable for cultivation, entirely destitute of water, and in parts to be travelled with caution. But it would be a mistake to infer that Central Persia is therefore unattractive. Quite the contrary is the case; in fact, I know of no country which within the same space contains a greater variety or stronger contrasts of scenery. The weary traveller turns with intense pleasure from the road over the arid waste to repose beside the stream, coursing under the clump of darkling foliage nestling in a gorge. And, on the other hand, it is with solemn rapture that he looks over the vast endless spaces; the soul expands with the sense of limits withdrawn, and seems already in this life to gain an intuition of the infinite spaces in which it shall find a fuller expression of its power in a future existence. It is because of these vivid contrasts of Persian scenery that the thoughtful and poetic mind finds it exceedingly fascinating and stimulating to the imagination.

A peculiar feature of this great table-land is the sand-

storms which especially prevail in March, although liable to occur at all seasons. They are most formidable in the southeast province of Kerwan, where an army of twenty thousand men was once overwhelmed and destroyed by such a storm. A sand-blast which I saw in Persia came on with the appearance of an impending thunder-storm, so dreadful in its look that it seemed to threaten a general convulsion of the elements. It approached rapidly, and when within two or three miles the landscape became obscured as if by a cloud-burst of rain. Rapidly it rushed over the plain, while we flew before it for shelter. But when the storm struck us it was accompanied by neither rain nor lightning. But there was a terrific, suffocating cloud of dust careering forward in dense whirlwinds, completely concealing every object at the distance of fifty yards, and the wind was of such fury as to tear off large branches from the trees. Happily these sand storms are not of long duration, and we may travel from one end of Persia to the other without meeting one, just as a mariner may circle the globe and not encounter a breeze strong enough to carry away a studding-sail boom.

There are two objects in a Persian landscape which cannot fail to arrest the traveller's attention and to arouse his curiosity. The villages on the plains are surrounded by lofty square walls, with battlements and towers. At first one fancies every village to be a fortress, and is surprised that such fortifications should be so numerous, and planted in the midst of a flat plain. But he soon learns that these are villages, and towards evening he shall see the flocks and herds wending hither and crowding with loud bleating into the great gate, which,

after their entrance, is closed for the night. Further inspection reveals an irregular huddle of hovels within the walls, constructed of sun-dried mud, and with domical roofs. In summer, these villages are hot as an oven, and but for the density of the mud walls would be insupportable. In such a climate, a dwelling should be either entirely open to invite every breeze, or it should be solidly built, and with scarce any openings, in order to exclude the heat. The fortifications which surround the Persian villages were intended to afford a certain protection against the incursions of the Turkomans, who until recently would steal across the country with silence and speed and carry the people into slavery. The robbers left as quickly as they came, and thus the rude protection the walls gave to the villages was absolutely necessary in a country so sparsely inhabited. But the Turkomans rarely invade the heart of Persia to-day, and the importance of protecting the villages has practically ceased. The custom, however, will probably prevail until some new impulse of progress introduces another system.

The other feature of the scenery of the central plateau to which I alluded, is found in the artificial mounds, which extend at regular intervals for hundreds of miles. These mounds are from sixty to eighty feet high, and resemble the tumuli on the plains of Troy. That they are not tombs or barrows is evident from their position at regular intervals of two miles over a distance of many leagues. That they must be artificial is proved by this regularity of position, while their antiquity must be very great, because the mound-building period was in prehistoric periods, and the Persians themselves can give no facts about their origin, except the general tradition that

they were thrown up in the time of Shah Jemsheed. This is a common phrase in Persia about objects of great antiquity, and simply means that they antedate any precise historical records. The Persians add, however, that these mounds were reared in order to telegraph with bale-fires the invasion of an enemy. This is very plausible, and the tradition may be accepted, since the Persians are too ignorant of comparative history to borrow the idea from other nations, and comparison with the early history of other nations does show that such a means of rapidly communicating tidings was not uncommon. A familiar example is the telegraphing the fall of Troy in one night across the *Ægean Sea*.

Before leaving this summary of the physical aspects of Persia, it may be of interest to sportsmen and naturalists to learn that the country abounds with game. The trout in the north of Persia are excellent. The salmon at the mouth of the rivers emptying into the Caspian, especially the *Harbaz* and the *Sefeed Rood*, are so numerous that the fisheries are farmed to an Armenian, who within a few years has amassed a fortune of millions. Partridges, quail, pheasants, and hare are everywhere found. Gazelles are often seen on the plains; their meat is exceedingly delicate and toothsome. They are hunted with falcons; a common sight in Persia is the mounted game-keeper, bearing a perch of hooded falcons, exactly as they did in Europe in the days of chivalry. Wild boar are common in the mountains and forests. The Persians hunt them for sport, but never eat them, as they consider pork unclean. This reminds me of an American firm of sausage manufacturers who wrote me to inquire about opening a trade in sausages with Persia. Probably the

article would meet with the same enthusiastic reception there as warming-pans in Cuba or palm-leaf fans at the North Pole. But, on the other hand, the Persians have a superstition that a pig in a stable has a beneficial effect on the horses, and it is not uncommon to keep a hog, or even a wild boar, for this purpose. A savage young boar was presented to me by a Persian gentleman for the stable of the Legation. A European of Teheran had a young boar that always slept by the feet of his favorite riding horse. When the master took a ride the boar followed after like a dog. But one day when they were on the mountains, the boar met some of his own kind and found the companionship so much more congenial than that of horses, that he forsook his equine friend and returned to his native woods. Panthers, wolves, jackals, and tigers abound in the jungles north of Teheran. Last winter was one of exceptional severity, and tigers were several times seen near the city. In the south of Persia lions are still seen, but they are becoming scarce. Venomous serpents are common in dry places, and a certain very disagreeable spider, resembling the tarantula, is altogether too frequent in the country-houses. But accidents from these creeping pests are rare, and the danger from them has been grossly exaggerated by credulous travellers.

The Shah has numerous hunting preserves, and, like many of his predecessors, is a great sportsman. It is partly to this that he owes his continued robust health, after a reign of nearly forty years. It gives him excellent relaxation from the cares of state, which weigh more heavily on kings than people generally imagine. Unlike a minister, a king cannot resign, nor can he, at least at

an Oriental court, lay aside his duties for a while in charge of a regent. The boom of a cannon at sunrise announces to the capital the news that his Majesty is about to start for an excursion beyond the walls. In former ages such an event was announced by a red banner hung on a lofty tower expressly built for that purpose. The Shah has numerous elegant palaces, or pavilions, in the neighborhood, to which he resorts on such occasions, attended by a retinue of courtiers, servants, and soldiers to the number of thousands. When he took his excursion to Mesched, the train included twenty-five thousand people, but part of them were a large military escort. When he does not visit a country palace, numerous tents are required, and an enormous train of mules and camels precedes the king, bearing the tents and baggage for a large encampment. The royal pavilions are of immense size, crimson on the outside, a color which for tents and curtains is reserved for royalty in Persia. The interior of these tents is lined throughout with superb designs in fine needlework, executed by the skilled women of Rescht and Schiráz.

On one of these occasions when the royal camp was by the *Jarge Rood* river, the stream suddenly overflowed its banks. The wives of the Shah rushed affrighted from their tents, and in their anxiety to keep their faces concealed forgot to save their jewelry. An obscure officer of the guards, with that quickness of sight to discover an opportunity which belongs to men of ability in affairs, carefully explored the spot as the waters subsided, and recovered most of the missing jewels. The Shah was so pleased that he promoted the man, who had the address to further ingratiate himself with the Shah until

he rose to be treasurer of the empire, accumulating great wealth and power which have been inherited by his sons.

Nusr-ed-Deen Shah is a courageous hunter. He scales the wildest passes in search of game, and does not recoil when face to face with danger. On one occasion when he was hunting among the tremendous defiles of *Sheristanék*, a large tiger suddenly appeared, and with several rapid bounds placed himself within a few feet of the king and his courtiers. Every one fled in dismay except the Shah and one of his ministers, the Emin-e-Douléh. Taking deliberate aim, the king shot the tiger through the heart. When the danger was past the frightened courtiers returned. The Shah in a good-natured way rallied them on their cowardice, and then added: "Look at my faithful subject, the Emin-e-Douléh! There's a man of courage! he did not desert his king in the moment of peril." But the Emin-e-Douléh, who is one of the shrewdest men in Persia, perceived at once that such praise from his sovereign would arouse jealousy and make him enemies unless counteracted. He therefore quickly replied: "As I am your sacrifice, O Asylum of the Universe, I did not run with the others, because my knees trembled to such a degree that I could not put one foot before the other."

When we come to a consideration of the people of Persia we enter upon a branch of the subject that can only be very inadequately presented within the brief space of an hour. The present population of Persia numbers about nine millions, which, for a long-settled country of such extent, is scanty indeed. There is no reason to believe that the population of Persia proper

was ever much larger than it is now. The vast hosts which she collected in ancient times are liable to mislead us. It should be remembered that great wars in those ages generally depended upon one or two decisive battles instead of numerous indecisive actions as in modern warfare. A large part of the adult male population of the country was gathered on a single field. The defeated army was exterminated, battles being rather a hand-to-hand slaughter than a combination of skilful manœuvres. The battle being lost or won, the war came to a close by the subjugation of the defeated. In addition to this, it should also be considered that Persia depended more on ability than numbers at the outset of her career. Having in this way subjugated the neighboring tribes or nations, she made them provide her with armies commanded by Persian generals, and thus continued to extend her conquests and sway. The present composite character of the population of Persia well indicates what was the character of her people when her empire existed upon a much more extended scale. It is a mistake to speak of all the people of Persia as Persians. They do not do so there; the distinctions between her various races are strongly emphasized. The genuine Persians are of course found throughout the empire, but their original stronghold, and the part where they are still most numerous, is the ancient Iran, now represented by the great central province of Fars and the adjacent districts. Persians use *P* and *F* interchangeably. Hence Ispahân is also pronounced Isfahân, and Fars is also Pars. From Pars comes the term Parsee, which is now applied to the fire-worshippers of India, because they were originally refugees from Persia. In the same fashion the name of

the country, Persia, should really be Parsia, being derived from Pars or Fars. The Persians call themselves Farsee and Iranee.

The Iranees are, as they always have been, a race having no intellectual superior in Asia. The arts, the literature, the philosophy, the poetry, the governing power of Persia have always been in their hands, excepting that at rare intervals the throne has been usurped by men springing from some of the subject races of the country.

The Persians are distinguished from the Turks, and indeed most Asiatic races, by their Aryan origin. That is, they spring from the same stock which gave birth to the Indo-European nations of Europe; the basis of their language is Sanscrit, and has much in common with European languages, especially the Latin. Of course in the progress of ages the Zand or Persian language has undergone many changes, and since the Mohammedan conquest many Arabic words have been incorporated into the literature and the vernacular in use by scholars. But it is worthy of note that the "Shah Nameh," or great epic of the kings, written by Ferdoosee, is almost entirely composed in original Persian. The Persians are a quick-witted, lively, agreeable people, handsome, and of mercurial disposition. They are easy-natured, but their passions are quickly aroused, in which respect they resemble the Latin races. What they were in the earliest periods we know not. But a supplementary chapter to Xenophon's ideal work, the "Cyropædia," shows that two thousand years ago they had already reached an advanced stage of moral corruption. Those who infer that Persia is to-day degenerate on account of the universal corruption which prevails, do not reason correctly.

There is every ground for believing that such a condition has been chronic in Persia for many ages.

Besides the Iranees, or real Persians, who are all at least outwardly Mohammedans, there is a small number, about 25,000, of fire-worshippers, called *Guabres* by the Mohammedan Persians. As the perpetuators of the old cult of the country founded by the immortal Zoroaster, or Zerdusht, these Guabres are the most unmixed descendants and representatives of the race that ruled in the time of Darius that are now to be found. They wear a peculiar garb, of which yellow is a prevailing hue, and, after being persecuted over a thousand years, are now permitted to pursue their avocations in peace. From what I could learn and see, the Guabres have more regard for the precepts of the moral law than other Persians. The famous poem of Thomas Moore, "The Fire-Worshippers," is known to all. But if Moore had looked more carefully into the subject, he would have avoided some of the errors included in that otherwise lovely poem. For example, the death of Hafed, who threw himself into the altar of fire and heroically perished, is undoubtedly very fine as poetry, but it is absurd when applied to one who is represented as a defender of the worship of Zoroaster. In that cult, fire is sacred, and the act which Moore attributes to Hafed is rank sacrilege. It is for the same reason that no fire-worshipper, or Guabre, ever uses tobacco. Not only does he never smoke himself, but to smoke in his presence is not considered quite courteous. I have no doubt that, if the rabid apostles of the anti-tobacco movement were aware of this fact, they would straightway proceed to import a live Guabre into America, to exalt him as a

moral hero, and endeavor, like most doctrinaires, to find in him virtues and qualities of which he never dreamed.

Besides these people, there are also colonies of Armenians and Nestorians in Persia, who represent Christian sects, and have nothing to do with the Persians, or with each other, except in matters of business, although subjects of the Shah; and the same observations apply to the Jews. Each of these bodies numbers about thirty thousand. The American missionaries, who have been fifty years in Persia, are sent to these three classes, as proselyting among Mohiammedans is strictly forbidden. Kurdistan, on the west, is a subject province of Persia. Its people make admirable rugs, but there seems to be no other reason for their existence, for they are a turbulent and blood-thirsty race, and have been so ever since Xenophon and the Ten Thousand fought their way through them 2,200 years ago. In the northern part of Persia there are many Turks who are thoroughly identified with Persia, which is indicated by their adoption of the Sheah faith, or the peculiar sect of Mohammedanism which prevails in that country. The present army of Persia is largely recruited from this part of the population, and is therefore well furnished with the best stuff of which soldiers are made, for there never were better troops than those who are of Turkish origin. The Turkish language is prevalent in Northern Persia.

Besides the various subdivisions of the population of Persia already described, we have to mention numerous tribes of nomads, numbering upwards of a million. They are nomadic in character, because their business consists entirely in the care of flocks, and they migrate with the seasons. In winter they live on the plains, and in sum-

mer they move their camps to the mountains. About two fifths of these nomads are divided into numerous distinct clans, each with its own dialect, and generally of a peaceable character. Although rarely of Persian stock, they fully acknowledge allegiance to the Shah, and in time of war furnish many recruits. They are in comfortable circumstances, for their taxes are not excessive, and the butter, textile fabrics, and wool, which they send to the markets, more than cover their moderate wants.

The remaining six hundred thousand nomads of Persia are chiefly Soories and Backtiarees, who pasture their flocks in Central and Western Persia. The Backtiarees are a very large tribe, numbering over four hundred thousand. They are warlike and turbulent, given to brigandage and thieving, and the stranger who goes among them will probably lose his life, and certainly his goods, unless accompanied by an efficient military escort or a royal safeguard addressed to the chief of the tribe. They are very wealthy, and their late chief was a man of great ambition, who gradually accumulated a stock of arms, probably with sinister motives. This gave rise to such suspicions that the Prince Governor of that province, the *Zeti-Sultân*, invited him to become his guest at Ispahân three years ago. Having got the chief in his power, the prince deliberately violated the laws of hospitality by stabbing his guest with his own hand. It is related of this chief that he was in the habit of having a ruby ground to powder and mixing it with a paste in the form of a pill, which he took every morning as a preventive of sickness.

Many traits of the Backtiarees suggest the Indians of our own country. They are cunning and skilful thieves.

Unlike other Mussulmans and Orientals, they name their children after wild animals, such as wolf, tiger, lion, and the like, to which some descriptive epithet is added. Other Persians, when they would name a child, open the Koran at random and take the name that first appears, of the same sex as the child to be named. To this is added sometimes a descriptive epithet, or the name of the father or mother. The consequence is that there is constant repetition of the same names, and one man cannot be distinguished from his neighbor, perhaps, except by an official or an honorary title, or the addition of the name of his birthplace. As, for example, there may be two Mehmet Alees employed in the same family. One perhaps is called Mehmet Alee Nazeer—that is, the steward; and the other is Mehmet Alee Meschedee—that is, native of Meschêd.

The Backtiarees are brave, and at the same time treacherous. A friend of mine, who was travelling among them on official business with a safe-conduct of the Shah, was sitting in his tent at the dead of night. Aware of the character of those people, he had taken precaution to remove every object from the edge of the tent to the centre around the tent pole. All was still; not a sound was to be heard, when suddenly he saw a long arm appear stealthily under the tent, like a snake, groping for something to steal. Raising a heavy club, he brought it down forcibly on the arm. Instantly the arm was withdrawn, but not a groan, nor even a whisper escaped to betray the fact that a man was behind that arm. All was done so quietly that not even the dogs were disturbed!

A Persian dignitary, who was travelling among the

Backtiarees to collect the taxes, was seated in his tent one evening quietly reading. His back was supported by cushions. For a moment he bent forward nearer the light. When he leaned back again the cushions had been removed, and he fell flat on his head with his heels in the air!

Backtiaree thieves have actually taken away the mattress on which a man and his wife were sleeping. The feat was done in this wise. The sleepers having fallen into a deep slumber, the thief has quietly and by great patience laid himself between them. First he touched one slightly and then the other. Each imagined in sleep that his partner was pushing, and thus instinctively and little by little rolled nearer the edge of the bed, which was on the ground. By a frequent gentle repetition of this manœuvre the thief at last succeeded in getting them both on the floor, and then walked off in triumph with the mattress.

As regards the Persians who live in cities and towns, it may be said that their civilization and customs are probably what they have been with little change from a remote period; how remote it is difficult to say. Like the Hindus and Chinese, the Persians claim an antiquity that may be measured only by the imagination; for their legendary history, like that of many people, far antedates authentic history, and the records of Persia that are historic are known to date back fully seven hundred years before the Christian era. The great epic poem of Ferdousee, which, like Mallory's "King Arthur," or the "Chronicle of the Cid," is an aggregation in permanent epic form of the early legendary records of Persia, is based upon national traditions which undoubtedly had their origin

in actual events lost in the vague mists of a vast antiquity. The chief legends of that remote period relate to wars between the people of Turan or the Tartars and the nation of Iran or Persia, and undoubtedly suggest the migration of races in the cradle of the nations. The reign of Shah Jemsheed doubtless means, not so much a king of that name as a long evolution from a condition of savagery to nascent civilization. Later comes the great Shah Kei Kaous, who was probably an actual character, and his great hero, Rustem, the Lancelot du Lac of Persian legend. The readers of Matthew Arnold's poetry are familiar with the majestic strophes of his tragic poem, "Sohrab and Rustum," in which Rustem engages in mortal combat on the banks of the Oxus, in the presence of two great armies, with his son, Sohrab, whom he had never seen, and who was searching for his father, when he fell by the hand of the hero whose prowess he had inherited. This, which is one of the most magnificent episodes in the whole realm of poetry, was borrowed by Mr. Arnold from Ferdousee, and paraphrased by him in masterly English.

The people of the settled classes are divided in the most rigid system of rank that was ever devised, although differing from the iron rules of caste as it is in India. The nobility, or those who are connected with the government, form one class.

Next in rank nominally, but practically first, are the mollahs or doctors of the law. Then follows a class of scholars and artists; after them comes the great class of those who are engaged in trade; below them is the class of mechanics, which necessarily includes artisans; and finally there is the numerous class of the peasantry,

which includes many subdivisions. All these classes are equally in the power of the Shah, who can degrade or execute any one at will; all are his slaves, and he in turn is the slave of God. It is not so very long ago since the Shahs of Persia used their tremendous power with awful cruelty and caprice. But under the present Shah there has been an extraordinary progress in this respect; the number of executions at Teheran to-day is little, if any, greater in proportion to the population than at a European capital. Executions no longer take place in presence of the king. He is a man of merciful disposition and of such intelligence that he brought back many enlightened ideas from Europe, while he is continually adding to these ideas by keeping himself well informed of what goes on in the world by reading daily the leading periodicals of the age. But in the provinces one hears occasionally of deeds of blood that remind one of what a tyrant is capable when he chooses. The governors of provinces have the power of life and death. By the Persian laws the *lex talionis* is in full force; the gravest offences may be condoned for money, and the exact amount for each offence is prescribed. Adultery and cognate offences are punishable with death for the second offence, but as in those crimes four witnesses are required, the laws applying to such cases are practically null, and one rarely, if ever, hears of the penalty for them being exacted. In the case of murder the remission of the penalty of death depends on the option of the family of the deceased. The accused is brought into the presence of the judge. If he is condemned, the friends of the other side decide his fate; if they accept gold, he walks forth a free man; but if they thirst for blood, he

is led into the court-yard and is decapitated. Here again the law allows the friends of the murdered man the option of executing the murderer themselves, if they so desire. But at present this option is usually declined. The judicial decisions rendered in such cases are generally just, so far as my observation goes. The Persian sees quickly, and a custom of arriving at swift conclusions enables the Persian judge to form a rapid and correct opinion as to the value of the evidence. Both sides of course perjure themselves without hesitation, if necessary; but from a knowledge of that fact, and an intuitive perception of character and probabilities, the judge forms conclusions that are usually correct.

One of the most prominent cases of great severity seen during this reign was when the Firmâh Firmâh, who is an uncle of the Shah, was governor of the important province of Fars. That region was greatly infested with brigands. Entire villages gave themselves to the business of attacking caravans and infesting the mountain passes. Commerce was actually in danger of stopping from this cause. The Firmâh Firmâh devoted his energies to putting down this scourge. In the course of two years he caused no less than one thousand men to be executed. This seems barbarous; but it was probably the only remedy that could be salutary in such a country, which is thinly peopled and inclined to turbulence, and where the people only respect the law as it shows its power. What has been the result? For twenty years scarce any country has been so safe as Central and Northern Persia. There is no comparison between the safety of the lonely roads of Persia to-day and the robber-haunted defiles of Asia Minor. I would far rather carry a family across Persia than over our Western plains.

Unlike the leading families of Turkey, and of most parts of the East, the nobility of Persia is often hereditary. A man of address or ability is not prevented from rising from the ranks to the highest positions below the throne, but once there it is quite the custom for his descendants to inherit his rank and official position for generations. They live in the manner of feudal lords. They acquire vast landed estates, own many villages, lay out superb pleasure gardens and retreats, and keep large numbers of servants and retainers. The Sedr Azem or present Prime-Minister of Persia is upwards of eighty; he has been in office in various capacities since his fifteenth year. His father was Treasurer of the empire before him. His household numbers not less than two thousand retainers. He goes abroad with a hundred men in his train. This is, perhaps, an extreme case. But men of wealth and position at Teheran who employ from fifty to one hundred servants are common. Many of these retainers get no stated wages, but are fed and clothed, and pick up such vails, commissions, or fees as may come along. They also enjoy more security for themselves and their families by being under the protection of a great man. There is no question that such a large proportion of so small a population devoted to domestic service is a detriment to the country, as they are all consumers and not producers. In former ages, when Persia included in her then vast empire perhaps one hundred and twenty millions of people, she could afford such a system; but it is quite otherwise now. All wealthy Persians keep open house. That is, a gentleman who is travelling always finds ready welcome and unstinted hospitality at houses of the same rank. This

is essential in a country so poorly provided with accommodations for travellers, and does not necessarily imply a generosity superior to our own. Likewise the poor can always obtain bread or a dish of pillau or rice in the kitchen of a wealthy Persian. This is in accordance with the inculcations to charity in the Korân, and is a means of preventing such extreme cases of suffering as we often see among our own poor.

Establishments conducted upon such a scale, of course, imply a complete and elaborate system of etiquette. The major domo, or head of the household, is called the *nazeer*. One of the most important domestics is the *pishketmêt*, who superintends the refreshments, which form a very important element in the visiting arrangements of Persia. In a large establishment he has under him several *chagirds*, or assistants. How carefully every thing relating to this matter is organized, is shown in the event of several guests of equal rank being at the same time seated with the host in the reception-room. In such a case each must be served to the sherbet, tea, coffee, or pipe at the same instant; and, therefore, the number of attendants bearing the refreshments must be equal to that of the guests and the host.

The stables form a very important part of every Persian establishment. Horses are excellent, and not dear. The state required abroad suggests the necessity of many horses, especially as, except in Teheran and neighborhood, this is the only means of locomotion in the country. Few Persian gentlemen have less than six horses; many have fifty to a hundred. This part of the establishment therefore includes the *mirahôr*, or equerry, who takes general charge of the stables, and twice a day measures

out the barley; the *gilodar*, who rides in advance, and a number of outriders. The hostler is in charge of the feeding and cleaning of the horses, and has an assistant for every four horses beyond the first four. He always sleeps in the stable, and receives the stick if, through his negligence, the horses suffer any injury. The stables are without stalls. The mangers are always niches in the mudwalls, and the horses are tethered to iron spikes in the ground. In winter the horses are very snugly housed, but in summer they munch their hay and barley under the trees in a corner of the garden. While the horses of Persia are very spirited and intelligent, they are far less vicious than American horses. This, I think, is due in part to the fact that they are more in contact with men, and receive many attentions from their keepers that show kindly feeling. The Persians are accustomed to blanket their horses far more warmly than we do. This has frequently aroused the derision of foreigners, who are accustomed to think that Orientals are every way inferior to Europeans. But for many ages the Persians have made a specialty of rearing some of the finest breeds of horses in the world, and, after looking carefully into the question, I have come to the conclusion that they have no superiors in a knowledge of the character and treatment of the horse.

The *mollahs* form the most influential body in the empire. They fill the double office of priests and administrators of the law. In Persia, there are two distinct forms of law: the *Shahr* and the *Urf*. The former is the written code, with the accepted commentaries which, in successive ages, have been grafted upon it. The latter, or the *Urf*, is the law of tradition or precedent; it is em-

ployed in small affairs or municipal cases, and the judges who try cases under it are like our trial justices. But, in case of doubt or of appeal, the Urf must always give way to the decisions of the Shahr, or written law, of which the word of Mahomet is the final statement. Differences as to the meaning of some of his decrees may, however, be settled by the corroborative decisions of one or more of the Twelve Holy Imams, who were descended from the Prophet. Their decisions are considered by the Sheahs, or Persian Mohammedans, as being an embodiment of great wisdom and authority. The Shahr forms an immense code, going into the utmost details for regulating life, with a minute scale of penalties for each offence. It is exceedingly rich on the subject of the transfer of property and the rights of property-holders, and in regard to all questions arising from the relations of the sexes. Some of its provisions are of the most extraordinary character.

Of course in a complicated system like this there must be different grades of mollahs, or judges; the highest in rank are called *mushtahéds*. The chief mushtahéd of all the Sheah Mussulmans is at Kerbeláh, the shrine where Alee, the son-in-law of the Prophet, is buried, near Bagdad, in Turkey. The chief mushtahéd in Persia must be a pupil of the great mushtahéd of Kerbeláh, who has gathered sanctity and knowledge from communion with the great fountain-head of Persian and Mohammedan law. The present chief mushtahéd of Persia is called Hadji Mollah Alee. His power is enormous, but is generally exercised with moderation and a semblance of humility. He rides abroad with only one attendant, but the Shah himself stands in his presence. When an important

question of law requires the interpretation of the highest legal authority of the land, it is referred to Hadji Mollah Aleë, whose decision is final. The method of applying for his opinion is by putting the point at issue briefly, in the form of a supposed case. Hadji Mollah Aleë inscribes his decision in the shape of a quotation from the Korân, written diagonally across the upper margin, and adds his seal to it. From that seal there is no appeal. While this great judiciary authority is naturally fanatical and opposed to progress, yet his decisions are generally rendered impartially, and with a careful examination into the possible results that might follow from the decision. In a test case of great importance last year, Hadji Mollah Aleë rendered a decision that bore hard against one of the greatest noblemen in Persia, and in favor of certain United States citizens, and neither bribes nor expostulations could induce him to swerve from his decision. But how essential it is that he should be moderate and just is shown by the vast influence he holds over the people. A word from him would bring about war or a massacre of every foreigner in Persia. I asked one of the guards that we were obliged to have at the Legation, what he would do if Hadji Mollah Aleë should order him to assassinate me. He coolly replied that while personally he should much prefer to do me no harm, yet that if ordered by Hadji Mollah Aleë, he had no option but to obey.

This very large and powerful body of the judiciary and priesthood is supported partly by great estates, donated to them from time to time by men of wealth, and partly by a regular stipend paid by the government. The duties of one of the chief ministers of the Cabinet

are to attend exclusively to the charge of the temporal affairs of the mollahs of Persia.

The scholars and artists of Persia are recruited both from the clergy and the laity. Within a limited range of subjects, the literary and learned men of that country are exceedingly acute. There is a court poet, who composes odes for special occasions. I heard him deliver an ode to the Shah, at the royal audience of the New Year, in a fine sonorous voice. Nusr-ed-Deen himself adds to his other accomplishments a taste for poetry, although he is not so brilliant in this respect as his great-grandfather, Feth Alee Shah. A love for poetry is one of the most marked traits of the Persians to this day. In the tea and coffee-houses not only in the cities but in the villages, it is a common occurrence to hear strophes from the Shah Naméh of Ferdoosee recited to enraptured throngs. As one travels the lonely roads of Persia, he often meets peasants singing strains from Hafiz. The poetry of Omar Khayâm, so well known with us through the fine paraphrases of Fitzgerald, is greatly esteemed by a select few; but he was a heretic, according to the opinion of the faithful, and to admire his verses in Persia to-day is much as if one were to show enthusiasm in the United States over the writings of Tom Paine. It is impossible at this time to go into an analysis of the different philosophical sects now existing in Persia, whose followers in many cases are identified with the finest literature of the country.

A distinct class of scientific men does not exist in Persia at present as with us. A philosophy of physics that rises above puerility is, one might almost say, foreign to the Oriental mind, although the Saracens and the Per-

sians were in the dark ages leaders in scientific research. The native physicians are sometimes men whose instinct or shrewdness enables them to treat a patient with some success; but they are, for the most part, arrant quacks, usually itinerants, who, after dosing the innocent people of a village with nauseous nostrums, take care to decamp before any of the patients die on their hands. Those who reside in the towns or attend the great are more cautious, for the death of the patient might involve the death of the physician. For this reason they do not themselves compound the medicines in such a case, but give the patient a list of the drugs required, and he sends his servant out to purchase them, and mix them in his presence. Amputations are avoided in Persian surgery, for a fatal result would bring about the death of one of the faithful, and it goes hard in Persia with any one, native or foreigner, who kills one of the faithful even by accident. European physicians resident in that country are beginning to show some boldness in practising surgery, but even they require to exercise caution. The Shah has two European doctors. At Teheran there are nine foreign physicians, including one American, and in other parts of the country are four additional American physicians. There is a medical department connected with the royal college at the capital, whose professors are Europeans. But anatomical studies can only be followed with the manikin, as it is supposed to be contrary to the Korán to dissect the human body.

When we come to a consideration of the artists of Persia, we enter a field so large and important, that we can give only the merest sketch of this part of our subject here. No people has ever been more thoroughly permeated with

an artistic sense of the beautiful than that of Persia, and at different periods this popular taste has been aided by the establishment of institutions for instruction in the various arts under royal patronage. The great Shah Abbas established art schools at Ispahan, sending artists abroad to study, and importing noted artists from India and China. He gave a practical encouragement to the arts by making his capital the most beautiful city in the world. In the terrible invasion of Mahmoud, the Afghân, some of the most beautiful monuments of Ispahan were defaced or destroyed, and in the massacre which attended the capture of the city, the conqueror deliberately caused every artist in Ispahan to be slain. It was at that time that the secret of some of the noblest arts of Persia perished, perhaps never to be revived. But the love of beauty still exists in the hearts of all classes, and the arts are still practised with considerable skill and success. The chief points in Persian art are that it has always been decorative in its character. With the exception of a number of portraits, it would be difficult to mention any works of the Persian artists that were not intended to enter into the decoration of some useful object—a building, a saddle-cloth, a mirror, a water-pipe, an inkstand, or a book-cover. Scarcely an object is made or has been made in Persia, however rude or simple, that did not show an attempt to add to its value by decoration, all of which is and has been without exception done by hand. And this suggests a second great feature of Persian art: its spontaneity. No two objects can be found that are in all respects identical; each object has in it an individuality of its own. The class of decoration in which Persian art has excelled has been, first, in archi-

ture ; second, in ceramic work, especially glazes. No people have equalled the Persian artists in this respect. Their old mosques are encrusted with iridescent tiles of extraordinary loveliness. The secret of making this iridescence has been lost for ages. The Moors borrowed their architecture, their stucco work, and their iridescent glaze from Persia, and from the same source, perhaps through the Moors, the Italians of the middle ages borrowed their glazes. Metal work, enamels, and textile fabrics, embroideries, and lacquered papier-maché wares represent other important branches in which the arts of Persia have achieved great distinction and success. Each master has made his own colors, in his own way ; and in the case of rugs and embroideries, the artisans themselves dye the wool and silk they use.

The two classes of mechanics and peasants which I have alluded to are, of course, numerous and important, but we can only give a glance at their peculiar traits. Both may be serfs if living in villages, for the villagers of Persia are under the authority of the nobleman who owns the village, and while they rent houses and farms of him, they cannot remove to any other place without his consent. But in practice this usage is losing its force. The lower classes are generally thrifty, and abject indigence is rare and slavery is now abolished.

If it be asked what are the domestic relations of the Persians, the answer is that, of course, polygamy exists, but the lower classes are generally satisfied with one wife at a time. Divorce is easy, constantly practised, and attended with no disgrace. A man has simply to say three times in succession to his wife, "You are divorced," and both are free. It is required, however, that he should have

some show of reason for such a course. She can marry again, but he retains her property. But there is a law of Persia which allows a woman to marry for any stated period, up to ninety or a hundred years. The conditions are that the amount of her portion be mentioned in the contract, and that during the period named she cannot be divorced, and thus cannot be deprived of her dowry. The wives, of course, live in great seclusion in the towns. In the country the necessities of the daily life of the poor give them more freedom. A Persian lady is married at eleven or twelve, and after that is seen by no man but her husband and her father and brothers. No male outside of her family may inquire about her health, or make her a topic of conversation. She goes to school when a child, but her education is limited. The quarter of the dwelling she occupies is on a separate court; it is called the *anderoon*, and is never overlooked by another house. The husband retires to the *anderoon* after his day's work is over, and is not accessible until he comes forth in the morning.

A great deal of sympathy has been bestowed upon the lot of Oriental women; it is very far from being my intention to say a word in favor of a system which tends to withdraw the fairest portion of the human race from the admiring devotion of the rougher sex. But when it comes to a question of pitying their lot, honesty requires us to admit that they bestow as much pity on our women as we do on theirs. Their system has existed three thousand years or more, and seems to them quite as satisfactory as our system does to us, and probably more so. Notwithstanding the restrictions under which they live, the women wield enormous influence, and are by far the

more important of the two sexes in Persia. They are obliged to go veiled in the streets, but this enables them to go where they please without discovery. Muffled in that mantle and veil not even her own mother can recognize a woman. Her own husband, whatever he may suspect, dares not touch her veil in the street. To do so is death. I knew of two Europeans who lifted the veil of a woman. The next instant they were both cut down by the infuriated bystanders. There was no redress. They had violated one of the fundamental customs of the East. The Shah's wives never ride abroad except with the streets cleared, and no one must look on them. A European general, employed as instructor in the Persian army, was unable to escape into a side street as the procession of the royal wives came by. He turned, face to the wall, and being something of a wag, saluted them by waving his hand behind his back. An attaché of the English Legation, in peeping over a wall to see the Shah's wives, contrived to knock a small bit of plaster off the wall, which fell on the cover of one of the carriages in which those ladies were riding. The incident was reported to the Shah, who gave the young Englishman just forty-eight hours to get over the frontier, and he went.

A French gentleman, living at Teheran, incautiously married a Persian woman. A mob stormed the house where he was; he escaped by lowering himself with a rope from the rear wall, and seeking refuge in a mosque, where he immediately abjured Christianity, and by turning Mussulman was permitted to live and have the woman, who had also been hidden during the riot. His children are Persians, and he himself is thus an exile from Europe.

A Persian woman was the cause of an emeute at Teheran forty-five years ago, in which the Russian Legation was stormed, and the minister, with all his family and suite, to the number of forty, were massacred. A Persian woman was again the originating cause of the difficulties which brought about the war between Great Britain and Persia in 1857.

The ladies of Teheran visit each other frequently, and find much entertainment and consolation by frequenting the public steam-baths, which at certain hours are reserved for them. These are a sort of ideal club for the Persian women, where they compare notes after the bath, embroidering and smoking the *kalian* or water-pipe, while all the gossip of the neighborhood and many domestic secrets are discussed. Often the most important transactions are conducted to a successful issue by the skilful intervention and persistent pleading of the women. Does a man wish to influence another, he does not depend on doing it directly if the case is difficult, but sends his wife or wives—in such a case the more the better,—who persuade the wives or the favorite wife of the other man to plead in behalf of husband number one. The raising of a loan, the settlement of a bargain, the life of a criminal, the solution of an important affair of state—almost any transaction, in fact, may be, and usually is, finally arranged in Persia by the intervention of feminine diplomacy. The ladies of Persia are the power behind the throne, as they are in every other part of the world. Fortunately for the other sex, they do not always fully realize what power they have, or the distribution of influence would be even more unequal than it is now. Notwithstanding the limited education of most of the women

of Persia, they are naturally bright and intelligent, and many cases are on record in which great and enduring affection has attended the conjugal relation. The story of the love of Chosrû and Shireen, which has been a theme for the poets and artists of Persia for ages, is founded on actual facts in the history of that great monarch. The sister of the present Shah and his aunt are women of great intelligence and considerable culture. Nusr-ed-Deen Shah, although a polygamist, has had fewer wives than most of his predecessors, and has been sincerely attached to two of them. The first favorite was a peasant girl, who was reaping in the fields when he was passing on a hunting expedition. She had the ready address to allow the king to catch a glimpse of her handsome features as he passed. As a result, she was promoted to the palace, and held a controlling influence over him until her death. She was the mother of the oldest and most talented of the king's sons. The present favorite, who has the title of Anisé-e-Doulêh, or Favorite of the Kingdom, is a woman who has been described by those who know her well as possessed of great force of character, of winning amiability of manner, excellent heart, and remarkable tact and feminine diplomacy. For fifteen years she has held a beneficent sway over Nusr-ed-Deen Shah, without any apparent diminution of her power.

The Shah has three sons and several daughters. The eldest son, called the Zeli Sultân, is hereditary prince, governor of the great central provinces, whose capital is Ispahan. He is a man of fine administrative ability, a firm will, and great ambition; but these qualities are tarnished by profound craft and dissimulation, and an inclination to malignant cruelty, resembling that of too

many Oriental tyrants. He looks every inch a king, but, although the eldest son, the law of primogeniture does not apply in his case, as his mother was of plebeian origin. The Shah, conscious of the precarious condition of Persia so long as Russia maintains her menacing aspect on the northern frontier, would gladly prefer to see the Zeli Sultân succeed to the throne, as he is opposed to Russia, and would be able, with his force of character and his friendship to England, to present a bold front to foreign aggression. The Zeli Sultân will probably contest the succession on the death of his father. The second son of the Shah, called the Valy-a-hed, is the Crown Prince, and, as such, governs the northwestern province of Azerbaijan. Not having seen him, I can only speak of him from hearsay. He seems to be a well-dispositioned man, whose qualities are negative rather than positive. He has shown some administrative ability. The youngest son, called the Naïb Sultanêh, is an amiable young man, who holds the two positions of Minister of War and Administrator of Teheran, the capital. He has fine manners, speaks French and German, and entertains very elegantly in European style.

As regards the future of Persia, it is of course difficult to speak, except in conjectural terms. It is hardly fair to form an estimate of her powers at this juncture, for she is in a transitional state, laboring to pass from the old to the new, to emerge from the chrysalis state of ancient laws and customs to the new splendor with which she may once more dazzle the nations. There are some, especially the enemies of Persia, who assert that she is even now practically a vassal of Russia, who only has to raise her arm to crush the prostrate nation, and destroy

the lingering remains of life forever. But this view does not seem to be justified by the facts. Unlike some other Oriental races, unlike the ephemeral tribal Khanates of Khiva, of Bokhara, or Afghanistân, Persia possesses a power of continued organization, recuperative resources, and national vitality that has never been equalled by any other nation. Time and again has she fallen, apparently to rise no more; time and again has she risen from her ashes more superb and majestic than ever. Russia may threaten, she may even for a time perhaps succeed in controlling Persia, but not permanently; for, sooner or later, this grand old people is sure to re-assert itself once more. What strengthens the position of the empire of Persia is the fact that England cannot see her crushed with safety to her Indian possessions, which would then be menaced from the Persian Gulf, while the German empire is seeking to develop for its manufactures an outlet in Central Asia through Persia, there being no passage through Russia, where free transit is forbidden. Prince Bismarck also foresees that the continued integrity of Persia is becoming essential to Germany in the continental war that cannot be deferred much longer. Guided by German officers, and aided by German arms and gold, the Persian army, composed of excellent material of war, would make short work of the vast possessions that Russia has recently acquired in Central Asia. In these observations I express no individual preferences regarding any of the powers joining in the general scramble to divide the spoils of Asia, but have only attempted to give a sketch of the situation as it appears to an impartial observer. There seems to be good reason, therefore, to hope that the Persian empire may continue to exist

for ages to come. Progress in an old country must necessarily be slow, but he who denies that Persia is following a forward and upward road has but very imperfectly studied the present condition of affairs in that country. Wars, convulsions, struggles, she must yet undergo. It is, alas, by hard struggling that any thing worth having is won in this world. But she will, in the end, emerge to a new day, and renewed influence and power are in store for the Land of the Lion and the Sun.

GEOGRAPHICAL NOTES.

Mr. H. Wichmann has published in the *Geographisches Jahrbuch* some statistics relating to geographical societies and publications throughout the world. The activity displayed by various European nations in colonial enterprises during the past ten years has greatly stimulated the interest in geography, two thirds of the societies now in existence having been founded within this period. There are now 94 geographical societies, representing 20 different countries. France heads the list with 26 societies and 18,000 members. Then follows Germany with 24, and 9,300 members; Great Britain (including the Colonies) with 5, and 5,300 members; Italy with 6, and 2,680 members; Austria-Hungary with 2, and 1,900 members; Russia with 4 societies, and 1,380 members; and the United States with 2, and 1,500 members.

Belgium, the Netherlands, Portugal, Spain, and the Argentine Republic have, each, 2 societies; Switzerland has 6, and Brazil 3, and Denmark, Sweden, Egypt, Roumania, Japan, and Mexico have, each, 1.

The Royal Geographical Society of London, with 3,400 members, is the largest of all. Next to this comes the Paris Society with 2,250, then the American Geographical with 1,400, the Vienna Society with 1,348, and the Italian of Rome, with 1,306 members. No other single society has a membership of 1,000 names; but the Geographical Union of Northern France, with 13 sections,

(central seat, Douai), counts 3,300 members, and the Central Union for Commercial Geography, with 12 branches (central seat, Berlin), has 3,000 members.

The richest of all the societies is the Royal Geographical, which has an income of \$47,000, including a subsidy of £500. Then follow: the African Society of Berlin with \$41,000, nearly all furnished by the government; the Imperial Russian of St. Petersburg, with \$29,000 (\$9,000 from government); and the Geographical Society of Australasia, at Sydney, with \$21,000, of which the government furnishes \$20,000.

Out of the 94 societies, 45 are absolutely self-supporting. Of those that receive subsidies, the German societies (leaving out the African of Berlin) receive on an average \$365 each, the French \$249, and the Italian \$927.

The smallest society is at Cassel, in Germany, with a membership of 20 names, and a revenue of \$22.50.

The oldest society is the Paris one, founded in 1821. After this come, in order, the Berlin Society, 1828; the Royal Geographical, 1830; the Rio de Janeiro Institute, 1838; the Mexican, 1839; the St. Petersburg, 1845; the Royal Institute, at the Hague, 1851; and the American Geographical, 1852; though branches of the Imperial Russian Society were established at Tiflis in 1850 and at Irkutsk in 1851.

The periodicals, 126 in number, are for the most part organs of the 94 societies, the best known and most important of the others being *Petermanns Mittheilungen*. Of the whole, 42 are printed in French, 38 in German, 8 in Russian, 7 in Italian, 6 each in English, Spanish, and Portuguese, and 3 in Dutch. The rest are in Danish, Hungarian, Swedish, Roumanian, and Japanese. The

Belgian and Egyptian publications, besides 2 in Switzerland and 1 in Holland, are in French, while 4 of the Swiss and 1 Russian are in German.

It is to be noted that the proportion of original work in all these periodicals is very great, and that, while the German geographers must be allowed to stand at the head of all, there is a general level of excellent performance in the publications of the different countries.

The *Revue Coloniale Internationale*, founded in July, 1885, by the Netherlands Colonial Association of Amsterdam, has published in the few months of its existence, a number of important articles. The titles of the longer papers in the six numbers issued up to Jan., 1886, are: Imperial Federation, German Colonial Policy, The Productive Forces of British Australasia, Mr. Stanley's Congo-International, Colonial Progress, The Political Significance of Islam in Netherlands-India, The New-Guinea Company, Martinique in 1789-1790, The Congo Free State, Australian Relations with France and Germany, A Forgotten Dutch Colony (Formosa), Opium Culture in Bengal, French Indo-China, The Mixed Races of the Philippines, Zanzibar, The Kongsi (Chinese Society) in Borneo, and Europeans in the Tropics.

Each number gives a careful bibliography of geographical books and periodicals.

The editorial work of the *Revue* is done in French, but the articles are written indifferently in English, French, and German. This plan of publication, intended, no doubt, to make the *Revue* strictly international, seems to be an unfortunate one. The subscriber who is able to read the three languages would read the *Revue* at least

as readily in any one of them, and with greater satisfaction, while the subscriber who is acquainted with but one or two of the languages employed must feel some degree of irritation, renewed with every number, at finding part of his magazine a sealed book to him.

There are other objections to the plan adopted. The three languages of the *Revue* are all foreign to the Dutch compositors, and the liability to errors of the press is needlessly increased. No editorial vigilance is quite equal to the continued strain of attention in three directions at once, and the compositors, who might gradually approach to accuracy if they had but one language to deal with, must find themselves helpless in the wrestle with three, and do nothing to lighten the editorial burden. The German and French articles suffer less than the English, because the editors are evidently more familiar with the two Continental tongues. In the English papers, the errors of the press and the faulty construction frequently make the reading an exercise in hermeneutics. The article on the "Congo-International" begins with these words: "Mr. H. M. Stanley has at last given *as* [us] the narrative of the work *he* [he] has so successfully accomplished," etc.

In the articles on Opium Culture, *weighment* is used throughout for *weighing*, and the structure of the sentences is unpleasantly foreign to an English reader. The writer of these articles, Mr. Wiselius, is apparently a German, but his English is none the more agreeable on that account. At the same time, it is better than Commander Lovett Cameron's, in his Review of "Stanley's Congo-International." To quote only two passages: "His enthusiasm for Africa is shown him, on his arrival

by his glowing description of the perfect health of the pilot," etc. And a little further on: "The diplomatic and political difficulties which after and whilst as engineer and transport officer, it was in the first capacity whilst teaching his men the way to use a sledge hammer that he won the *soubriquet* of 'Bula Matari,' Mr. Stanley had to encounter must also, to be appreciated and enjoyed, be read in his own words, and the fertility and readiness of resource combined with good humor, especially in his dealings with Ngalemya which he manifested are pieces of most entertaining reading."

There are indications in these curious sentences that the original was in French, and that the English is Dutch-English; but who is responsible for the bastard *soubriquet*?

It would increase the usefulness and strengthen the position of the *Revue* to lay aside the mistaken trilingual character, and adopt frankly, and once for all, either French or German for its only language.

The great geographical establishment of Justus Perthes, Gotha, celebrated its centenary on the 11th of September, 1885.

The founder of the house was Johann Georg Justus Perthes, born at Rudolstadt, September 11, 1749. The house was not at first a geographical establishment. Its first publication in cartography was the "Hand-Atlas über alle bekannte Länder des Erdbodens," with twenty-four copper-plate maps, by Professor Hensinger, of Dresden. This was brought out in 1809. In 1817 appeared the first part of Adolf Stieler's Hand-Atlas, Wilhelm Perthes having become the head of the establish-

ment the year before. To him succeeded, in 1853, Bernhard, who died in 1857, leaving a son, now at the head of the house.

These facts are taken from the quarto volume, issued (for private circulation) to commemorate the centennial celebration. This work gives brief biographies of the famous cartographers Stieler, Berghaus, Spruner, Sydow, Bretschneider, Behm, Wagner, Supan, and others, besides numerous portraits, and at the end a tabulated list of the force, staff and workers, employed by the house, 190 in all, 82 of them women.

Richthofen, in his "China," describes the formation of soil by deposit from air currents. Prejevalsky has found similar deposits in Tibet, and in October last M. Violet d' Aoust read to the Paris Geographical Society a note on formations of this nature which he had examined in Mexico. He found on the flanks of the highest mountains argillaceous deposits which could not be referred to the decomposition of the rocks *in situ* nor to the action of rivers or of rain. In the day the winds raise the particles from the plains and carry them at night to the mountains, where they form deposits, often thirty and fifty and even one hundred metres in thickness.

The accumulations ceased at the limit of the growth of grasses, where there was no longer any thing to retain the particles. M. Jules Garnier, in a later communication to the same society, says that he found at Lifu, in the Loyalty Islands, a bed of ferruginous clay on the top of the coral formation, and he refers this deposit to the precipitation of matter thrown out by the volcanoes of the New Hebrides, there being at Lifu neither water-

course nor sign of ancient rivers. Similar formations are found, he adds, in the Sahara about the springs of water, which catch the particles of matter brought by the winds.

The Argentine Government established, in July, 1885, a Bureau of Deposit and Distribution, in order, so the decree says, "to promote and to serve the international exchange of publications." The bureau receives from foreign governments, legislatures, colleges, and societies, and also from individuals, books and pamphlets (not of a commercial character) for delivery to the various departments, societies, and literary and scientific bodies and institutions in the Argentine Republic; and it undertakes to receive and transmit to foreign countries Argentine publications of a similar kind.

The address of the Bureau is:

Oficina Nacional de Depósito y Reparto de Publicaciones,
Alsina, 29,
Buenos-Aires.

The following from the *Geographical Notes*, in the Proceedings of the Royal Geographical Society for April, 1886, will be read with some surprise:

"A New U. S. State.—The United States Senate issued a decree on February 7th by which Dakota Territory is erected into a State—the thirty-ninth. The present Territory of Dakota is divided under the 46th parallel, the south half becoming the State referred to, while the northern section will be known as Lincoln Territory."

It is not generally understood here that Dakota has been made a State, and the American public will feel

a natural curiosity to know what is meant by a "decree" of the United States Senate. The Royal Geographical Society will, perhaps, explain its dark saying in a future number of the Proceedings.

Commercial-Geographical Exhibition at Nantes, France.—The Geographical Society of Nantes has organized, with the aid of the city, an exhibition, which is to be opened on the 10th June and closed on the 15th August. The programme includes five sections: Scientific Geography, Ethnography, Travels and Means of Communication, Natural and Commercial Products of the West and of the Colonies, and Scholastic Exhibition.

Manufacturing and commercial exhibitors will have the right to sell the articles contributed.

Address: The Geographical Society, Nantes, Loire-Inférieure, France. No exhibit received after the 10th April.

Ethnological Industrial Museum at Aarau.—The Society of Commercial Geography at Aarau appeals to its well-wishers throughout the world for contributions to its permanent Industrial Museum. Any gifts will be accepted, and it is particularly requested that raw products be sent in their natural as well as their commercial form, and that they be labelled, if possible, with their local, commercial, and Latin names.

Correspondence should be addressed to the Secretary-General, and articles sent to the

Ethnologische Gewerbemuseum

in Aarau,

Switzerland.

M. Alfred Rabaud, president and founder of the *Marseilles Société de Géographie*, died in that city on the 12th of April, 1886, at the age of fifty-eight years.

A biographical memoir will appear in the next *Bulletin* of the *Société*.

The *Verein für Erdkunde*, of Leipsic, celebrated its twenty-fifth anniversary, on the 1st and 2d May, by a meeting and a banquet.

What are *nearly equal halves*? Three or four months ago Mr. Grant Allen, in reviewing the "Life of Agassiz," then just published, declared that "this life naturally divided itself into two nearly equal halves." In the *Scottish Geographical Magazine*, for April, 1886, Dr. R. W. Felkin, F. R. S. E., in a description of Uganda, says: "The equator divides the land into two nearly equal halves." When the equator forgets its own honorable traditions it is time for geographers to interfere.

One after another the pleasant tales of history are going over to the legendary majority. Mr. Justin Winsor, in his "Narrative and Critical History of America," vol. ii., p. 91, cites from M. Harisse's "Christophe Colomb," the result of investigations into the origin of the famous story of the council, convened at Salamanca, to hear and sit in judgment on the theories of Columbus.

The first mention of this council is by Antonio de Remesal, in his *Historia de la Provincia de San Vincente de Chyapa*, published in Madrid in 1619; and M. Harisse asks why Las Casas, from whom Remesal borrows so much, did not know something of this *junto*? He counts

for much that Oviedo does not mention it; and the Archives of the University at Salamanca throw no light. The common story he believes to have grown out of conferences which probably took place while the court was at Salamanca in the winter of 1486-1487, and which were conducted by Talavera; while a later one was held at Santa Fé late in 1491, at which Cardinal Mendoza was conspicuous.

Mr. Frederick D. Stone, Librarian of the Historical Society of Pennsylvania, on page 477 of vol. iii. of the "Narrative and Critical History of America," assigns the choice of the name Pennsylvania entirely to King Charles the II., who intended it as a mark of respect to Admiral Sir William Penn (the conqueror of Jamaica), the founder's father. Mr. Stone quotes from Wm. Penn's letter, written March 5, 1681, to Robert Turner:

"After many waitings, watchings, solicitings, and disputes in council, this day my country was confirmed to me under the Great Seal of England, with large powers and privileges, by the name of Pennsylvania, a name the king would have given in honor of my father. I chose New Wales, being as this a pretty hilly country, * * * for I feared lest it should be looked as a vanity in me and not as a respect from the king, as it truly was, to my father, whom he often mentions with praise. Thou mayst communicate my graunt to friends, and expect shortly my proposals; 't is a clear and just thing; and my God, that has given it to me through many difficulties, will, I believe, bless and make it the seed of a nation. I shall have a tender care to the government, that it will be well laid at first."

Mr. Stone does not seem to agree as to the origin of the name with the writer of the article on Penn, in the latest edition of the "Encyclopædia Britannica," Mr. Osmond Airy, who repeats the well-known form of the story, that Penn himself suggested the name "Sylvania," that the king gave the prefix "Penn," and that Penn tried in vain to bribe the secretaries to suppress it.

The harbor N. W. of Port Constantine, in New Guinea, is hereafter to be known as "Friedrich Williams Hafen"; the bay near it, as "Prinz Heinrichs Hafen"; the river E. of Cape della Torre as "Kaiserin Augusta Fluss," and Beapré is to be called "Varzin."

In the Bismarek Archipelago the islands are re-baptized.

New Ireland is now "Neu Mecklenburg," and New Britain, "Neu Pommern"; and the Duke of York group is Neu Lauenburg.

It is ill arguing with the master of thirty legions, who has decreed these changes, and it is to be hoped that they afford to the imperial mind the satisfaction they do not give to geographers.

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

AMSTERDAM.—*Revue Coloniale Internationale*, Jan.—April.

* Effect of Party Government on Native Affairs at the Cape of Good Hope—The Mahdi—European Colonization in Dutch East India—

* The Island of Flores—The Tribes between

* Articles marked with * are in English.

Sika and Mangaroai—Hadramaut—The Colonial Question in Italy—The Present Political and Commercial Situation of Harar in East Africa—Germany's Consular Representation outside of Europe—Proposition Concerning the Statistics of Climatological Observations in the Colonies—*Canada as a Nation—A New State in Central Africa—*The South African Diamond Fields—Public Instruction in Australia—*The Cinchona Market in 1885—A New Atlas of the Sunda Archipelago—*Current Australian Topics—Report of a Journey from Vivi to Issanghila and from Lukunga to Matadi—Supplement to the paper on Hadramaut.

BERLIN.—*Zeitschrift der Gesellschaft für Erdkunde*, vol. xx., parts 4 and 5.

The Marsh Lands of the Elbe—Contributions to the History of the Age of Discovery—Columbus as a Navigator and Seaman—The Southern Carpathians between Retjezat and Königstein—Remarks on Blumentritt's Map of the Island of Mindanao. From the Spanish of Enrique de Almonte—Third Annual Report of the U. S. Geological Survey, 1881–1882.

Deutsch Kolonialzeitung, Jan.–April.

The German Colonial Union—Communications from the Bureau of Information of the Union—The Chancellor's Memoir on the German Protectorates—An Excursion to Dar-es-Salaam—From Kaiser Wilhelm's Land and Bismarck Archipelago—Natural Products, Industry, and Com-

merce of Chios, Tschesme, and Smyrna—A Site of German Industry in the Caucasus—Colonial Political Events—The German Colonial Union in South Brazil—Rio Grande do Sul—The Colonial Development of Southwestern Africa—Land and People of Eastern Africa—Administration of Justice in the German Protected Regions—The German Emigration Movement from the Ports of Germany—Acclimatisation and Climatic Fevers—The Colony of São Feliciano in Rio Grande do Sul—The States of the La Plata and their Development by Means of Cattle-raising—The Monroe Doctrine—The Forest Region of the Provinces of Rio de Janeiro and Minas Geraes—Fundamental Conditions of Colonization in the Tropics—The Asiatic Society (A Prussian Company)—The Question of Emigration—The Benadir Coast, Somauli Land—The Disadvantages of Brazil, with especial reference to the Province of São Paulo—The Case of Peschuel-Loesche against Stanley—The German Colonies of Chili, with regard to their business relations with the Mother Country—The Financial Condition and Commerce of Chili.

Mittheilungen der Afrikanischen Gesellschaft.

The Congo Expedition—The Expedition in the Western Soudan.

BERNE.—*VII. Jahresbericht der Geographischen Gesellschaft, 1884–1885.*

Arnold Guyot, the Reformer of Geographical Instruction in the United States—Historical,

Geographical, and Statistical Study of the Hawaiian Islands—On the Circulation of the Waters of the Ocean—The Republic of San Salvador—The Universal Hour and the Decimal Division of Time (In French and German.)—Life on the Congo—Central Asia—Mexico and its Environs—Gustav Nachtigal—Robert von Schlagintweit—The Civil War in Central America—Programme of the Plan of a Geographical Manual (In German and French.)—Events in San Salvador—The Province of Tucuman—Scenes in the Argentine Republic—Geographical, Historical, Statistical, and Commercial View of the Argentine Republic. (In French and German.)—The Universal Spherometrical Watch of 24 Hours—The Centenary of the Justus Perthes Institute.

BORDEAUX.—*Bulletin de la Société de Géographie Commerciale*, Jan.—April.

Canal between the North Sea and the Baltic—The Commune of Monsac (Dordogne)—The Fifth Campaign on the Upper Senegal: 1884–1885—The Line of Telegraph from Saldé to Bakel (Senegal)—From Bordeaux to the Sea—Transactions: Lecture on the French Race in Canada. Universal Commercial Language; or, Volapük—Transactions: Lecture on Madagascar—Notes on Various Natural Products, mostly African—The North Sea Canal: Von Moltke's Address in 1873—Correspondence: The Ogowé River and the German W. African Co.'s Treaty with the Sultan of the Somaulis—Transactions: An-

nual Meeting and Lecture on Russian Lapland—A Few Notes on Northern Madagascar—Agriculture on the Gaboon—Transactions: Lecture on the Industrial Cities of Northern France.

BOSTON.—*Appalachia*, March.

The Tripyramid Slides of 1885—Earthquakes in New England—A Day on Flume Mountain and a Night in the Wilderness—Middlesex Falls—Accurate Mountain Heights—An Exploration of the Pilot Range—Mountain Meteorology—Reports of Councillors for the Autumn of 1885, on Natural History, Topography, Exploration, and Improvements—Proceedings—Excursions, Season of 1885.

BREMEN.—*Deutsche Geographische Blätter*, vol. ix., part 1.

Nature in Iceland and its Influence on the Population—A Journey in the District North of the Cameroon Mountains—Danish Explorations in Greenland—The Exploration of the New Siberian Islands.

BRUSSELS.—*Le Mouvement Géographique*, Jan.—April.

Exploration of the Uruki and the Lulongo—The Port of Leopoldville—The Congo Railroad—Lieut. Taunt—The Kilu-Niari—The Congo and Mr. Peschuel-Loesche—The Congo Free State—Exploration of the Aruwihimi—The Longest Tunnel in the World (Croton Lake)—The Baltic Canal—The Geography of Belgium—The Bunga, a New Affluent of the Congo—The Mersey Tunnel—The Bulletin of the Observatory and the Prediction of the Weather—

The Simplon Tunnel—Madagascar—Lieut. Coquilhat among the Bengala—The Lulua and the Empire of Mwata Yamvo—Railroads in the United States—The Temperature and the Rains of the Lower Congo—An Eclipse of the Sun on the Congo—Gen. Prejevalsky in Central Asia—The Congo State—Monuments and Landscapes of India—Central Africa from a Geological Point of View—Railroads in China—Explorations of the Banks and the Affluents of the Congo—The Bengala Station—The Outlets for Belgian Products in Congo—The New Wissmann Expedition—The Sale of Improved Firearms in the Congo Region—Mr. Peschuel Again—The Future of the Congo Country—The African Indies—German Explorers in the Koango and Kassai Basins—The Ubangi Wellé—The Congo State—The Balkan Peninsula—Berghaus' Chart of the World—Andorra and San Marino.

Société Royale Belge de Géographie, Jan.—Feb.

Capt. Hanssens in Africa—The Port of Amsterdam—The Problem of the Movement of the Waters in Lake Tanganyika—The Theory of the Geysers—The Rivers Sette-Cama and Celina.

BUDAPEST.—*Société Hongroise de Géographie*, vol. xiv., parts 1 and 2. (Text in Magyar, with a French abridgment.)

The Austro-Hungarian Monarchy in Words and Pictures—Opening Address by Arminius Vámbéry, at the General Meeting of the Society, Jan. 21, 1886—Report for the Year 1885

—The Writers Who Have Described Hungary in 1885—The Turkish Race—A Detailed Programme of the Teaching of Geography in Foreign Countries and in Hungary.

EDINBURGH.—*Scottish Geographical Magazine*, Jan.—April.

Names and Places in Easter Ross—Physical Condition of Water in Estuaries—Royal Geographical Society's Education Schemes, and the Exhibition of Geographical Appliances—East Central Africa and its Commercial Outlook—Exploration Survey for Railway Connection between India, Siam, and China—The Ancient Civilization, Trade, and Commerce of Eastern Africa—The Geographical Evolution of Europe—Uganda—Three Years of Arctic Service (Review of Greely's Book).

GENEVA.—*L'Afrique Explorée et Civilisée*, Jan.—April.

Suppression of the Negro Slave Trade—Circumnavigation of Madagascar—Correspondence: Letter from the Zambezi—Morocco—Recent Exploration of the Affluents of the Congo, by Grenfell and Von François—The English Missionaries in Uganda, and Bishop Hannington—A Campaign against the Importation of Spirituous Liquors into Africa—Morocco from an Industrial and Commercial Point of View—The Latest Results of Savorgnan de Brazza's Work—Correspondence: Letter from the Spelonken (in the Transvaal) — The Murder of Bishop Hannington—Commercial Freedom in the Niger Basin.

GoTHA.—*Petermanns Mittheilungen*, vol. xxxii., parts 1-3.

From Hodeida to Sana—The Eruption of Krakatao in 1883—Samanez' Travels on the Apurimac, Eni, and Tambo in 1883 and 1884—The New Danish Explorations in Greenland—Kaffirland on the Lower Olifant—The Primary Causes of the Increase in the Number of Lightning Strokes—Maj. Heath and Lieut. Peyton's Journey from Harar to Berbera, in June, 1885—A Contribution to the Theory of Erosion—The Likona Question—Results of the Levelling Operations in Siberia.

Ergänzungsheft, No. 81.

Geographical and Geological Studies on the Böhmerwald.

HAGUE, THE.—*Bijdragen tot de Taal-Land-en Volkenkunde van Nederlandsch-Indië*, series 5, part 1.

Something on Mnemonic and other Signs and Marks in Use among the Peoples of the East-Indian Archipelago—Betrothal and Marriage Solemnities and Customs among the Peoples of the Indian Archipelago—A New Atlas of Netherlands India—The Cultivation of Coffee in Brazil (Answer to Critics). *French*.

HAMBURG.—*Mittheilungen der Geographischen Gesellschaft*, 1885.

Narrative of a Journey in Venezuela: parts 2-5.

HAVRE.—*Bulletin de la Société de Géographie Commerciale*, Jan.-Feb.

A Few Weeks in Colombia—Colonial Wool and the London Market—Study of the Amazon Basin, Pará.

JENA.—*Mittheilungen der Geographischen Gesellschaft*,
vol. iv., part 3.

Travels in Northern Ashanti and in Eastern Volta—
Ethnology and Philology of Africa—A Journey
in Northern Siam.

BOTANICAL PORTION.—Supplement to the Monograph
on the *Epilobium*—Remarks on the *Mandragora*
and Description of a New Species—On the
Geographical Diffusion and Naturalization of
the *Erodium Cicutarium*, etc.—The Wild Roses
of Jena.

LEIPSIK.—*Mittheilungen des Vereins für Erdkunde*, 1884.

Results of Meteorological Observations in the Leip-
sic Observatory in 1884—On a Newly-Con-
structed Globe with the Relief of the Ocean
Soundings—The Great Ararat and the At-
tempts to Climb it (from the Russian)—The
Lakes of the German Alps (with Atlas)—The
Results of the Meteorological Observations of
Soyaux and Schran in Sibange-Farm, Gaboon
—Remarks on the Results of the Meteorological
Work in Herero and Namaland.

LONDON.—*Proceedings of the Royal Geographical So-
ciety*, Jan.—April.

Exploration Survey for a Railway Connection be-
tween India, Siam, and China—On Bathy-
Hypsographical Maps: with Special Reference
to a Combination of the Ordnance and Ad-
miralty Surveys—Letters from Colonel Preje-
valsky—Notes of a Journey in Karateghin and
Darwaz in 1882, by M. Kossiakof (Translated
and Annotated)—A Journey from Cape Town

Overland to Lake Nyassa—Notes on Mount Everest. The Chains of Cassius and Amanus—The Herat Valley and the Persian Border from the Hari-Rud to Sistan—Arctic Exploration with Reference to Grinnell Land (Greely)—Further Notes on "Mont Everest"—The Hill-Slopes of Tong-King—Recent Explorations in the Basin of the Volta—A Last Note on Mont Everest—The Keeling Islands.

Nature, March and April.

Notes on the Volcanic Phenomena of Central Madagascar—Deposits of the Nile Delta—The Survey of India—Geographical Education and Natural Science—The Upper Wind Currents in the South Indian Ocean and over the N. W. Monsoon—The Greely Arctic Expedition—The Krakatao Dust-Glows of 1883-1884.

MADRID.—*Boletín de la Sociedad Geográfica* (two numbers missing), Feb.

The Earthquakes—Solution of the Spanish-German Difficulty—Influence of the Colonizing Spirit in Universal Civilization.

MANCHESTER.—*Journal of the Manchester Geographical Society*, Oct.-Dec., 1885.

The Great Northwest: The Pacific Slope—New Europe: Roumania, Servia, Bulgaria—Review of Stanley's "Congo"—Correspondence: Ten Kate in Surinam, Port Said, and the Red Sea,—The Lugenda River—Reports of Education Committee on Geographical Education.

MARSEILLES.—*Bulletin de la Société de Géographie*, Jan.—April.

The Argentine Republic—A Study on the Aurès Mountains in Algeria—From the Canebière to the Port Royal (an Inland Voyage through France)—The Island of Anticosti.

MILAN.—*L'Esplorazione Commerciale*, Jan.—March.

Italy on the Eastern Coast of Africa—Prehistoric and Historic Africa—We Must Make Haste—Correspondence: From Tripoli and Bengazi—News from Our Expedition (to the Red Sea)—Correspondence from Lagos—Our Possessions in the Red Sea—In the Province of Misiones (Argentine Republic)—The Italians in South America—Emigration to the La Plata.

NAPLES.—*Bollettino della Società Africana d'Italia*, Jan.—March.

Italian Emigration—The Geographical Movement and the Moral Results of the Year 1885—The Expedition to Harar—The Attitude of the Government towards Emigration—African Explorations—The Commerce of the Congo Basin—Notes on the Slave Trade.

NEW YORK.—*Science*, March and April.

Geography Teaching in Germany—The Swamps of the United States—The Rocky Mountains as Seen from the Canadian Pacific Railway—Some Work of the Government Surveys—The Railway to Central Asia—The European Colonies and their Trade—A Trade Route between Bolivia and the Argentine Republic.

PARIS.—*Société de Géographie, Compte Rendu*, Jan.—April.

Correspondence: Mé-Kong River—Morocco, Algeria, Tunis, Senegal—The Congo Region—The Southern Chaco—American Vines in the Sixteenth and Seventeenth Centuries—Remarks: On Lake Moeris, by Mr. Whitehouse—Australian Exploration of New Guinea—Greenland Exhibition at Copenhagen—Reception of de Brazza by the Society—Right of Property in Maps and Charts—Remarks of the Prince of Monaco on the Gulf Stream—Notes: On Awgueroot (Touat Oasis, Sahara); Ten Kate in South America—Correspondence: Africa, Asia, Europe, America, Oceania—Remarks: On the Colonization of Madagascar under Louis XIV.; On the Canadian Pacific Railway and the Indians—Notes: On the Transcaspian Railway; Longitudes in the Sahara; Exploration of the Pilcomayo—Correspondence: France in 1789 (to be described for the Exposition of 1889); Russia—Asia: Russo-Afghan Boundary; Assam; Tong-King—Africa: the Word Makoko in Old Maps—America: Exploration of the Pilcomayo: Arctic Regions—Remarks: On Medals and Prizes for 1886; Centenary of Arago; Tong-King; Chaco Austral—Notes: On a Canal between the Saône (Arar) and Moselle (Mosella) in the First Century; Relations of France and Hungary; Sheik-Said; The First Christian Martyr in China; The Gunboat *Djué* on the Ogowé; Bamboo Oil—Correspondence:

Europe; Asia; Africa: Serpa Pinto—Remarks: On Tong-King; Gorges of the Tarn (Les Causses in the Cevennes Mountains); Senegal and French Soudan—Notes: On Needham's Journey in Assam and on the Frontier of Tibet; Roman Canal between the Meuse (Mosa) and the Rhine; Guillaume de Prato; Crossing of the Atlantic by a Vessel from the Canaries, 1731—Correspondence: Les Causses—Asia: Russian Explorations—Africa: Petroleum in Egypt—America: The Pilcomayo; Arctic Regions—Remarks: On Koch's Map of Western Africa; Map of Afghanistan; The Aba (a Geodetic Instrument); The Route from Tangier to Fez—Notes: On Relations between India and Tibet; Ruined City in the Nefzawa (Sahara); The First European Embassy to China, 1521; The Mission at Lakhon; The Tong-King; China Frontier—Correspondence: Denmark, the Struggle between the German and the Danish Tongues; Europe and Asia; Russian: Level of the Lakes Ladoga, Onega, and Ilmen; Chinese Expedition; A Road in Persia—Africa: Death of Lt. Palat—America: Map of South America—Oceania: English North Borneo Company—Remarks: On Avesnes; Xibalba, State and City of Ancient Mexico—Notes: On the Passage into Thrace of the Three Races which formed the French Nationality; Sequeira (Sheik-Said, on the Red Sea); Point Camoëns (Camau, at the Mouth of the Mé-Kong); Arming the Annamite Christians.

Revue Géographique Internationale, Jan.—March.

France Abroad—The Tatras Mountains—Dr. Ten Kate in Dutch Guiana—The Alpine Climbers at Turin—Algeria—Reports from Abroad—The Rhone and the Port of St. Louis—Charter of the North Borneo British Co.—Notes on the Economical Condition of Italy.

Le Tour du Monde, Jan.—April.

The Lakes of Equatorial Africa—Persia, Chaldea, and Susiana—Krakatao and the Strait of Sunda—Friesland—Luzon and Palawan: Six Years in the Philippines—Journey to Nepaul.

La Revue de Géographie, Jan.—April.

M. C. Malte-Brun to Napoleon (1809): Memoir on the Colonization of the Island of Formosa—Topographical Studies on the Pyrenees—The Earth and Man—The Geographical Movement—The Value of Colonies—The Usefulness of Topography—Classical Education through Geography—An Historical Consequence of Baer's Law—The French Alpine Club—Bagdad: The City of the Caliphs; Life in Bagdad—The Natives of Algeria—Formation of the Hungarian Nationality—Reception of M. de Brazza at the Cirque d'Hiver, Jan. 21, 1886—Itinerary from Wezzan to Meknes—The Learned Societies and the Centenary of 1789—Australia; Victoria—The Question of Cape Blanco—The Non-Hungarian Nationalities of Hungary—The Theory of the Environment in History and the Hierarchy of Historical Causes.

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In preparing the following paper, I have made free use of the excellent work of Lieutenant Sullivan, U. S. Navy, on interoceanic transit, from which I have obtained much valuable information. I wish also to acknowledge my indebtedness to the interesting works of Mr. Rodrigues on the Panama Canal, of Professor Nourse, U. S. N., on the Suez Canal, and to the pamphlets of Captain Eads and Mr. Corthell on the Tehuantepec ship railway. I have received also valuable information from the officials of the Panama Railroad and the Panama Canal works in examining the progress of the canal construction, and from the officials of Nicaragua and Costa Rica in my brief visits to those republics.

My thanks are especially due to Rear-Admiral Ammen and Civil Engineer Menocal, U. S. Navy. To the knowledge and ability of these gentlemen, and to their patriotic zeal, America will some day be largely indebted for the existence of a Nicaragua Canal.

H. C. TAYLOR,
Commander, U. S. Navy.

THE NICARAGUA CANAL.

Ladies and Gentlemen :

In speaking to you to-night concerning the problem of connecting the oceans, it may be well to say in advance that I am a firm believer in a canal by way of Lake Nicaragua. I will add, however, that I have been brought to that belief by no interest in one route over another, but by unprejudiced study of all the routes for many years, and by some personal observation and experience.

We will consider principally three localities and methods by which the oceans may be joined : Panama, a sea-level canal ; Nicaragua, a canal with locks ; Tehuantepec, a ship railway.

Upon these three routes the interest of the world's commerce has centred. There have been others—some of them with ardent advocates,—and a slight notice of them may do something to clear the ground before we come to a more detailed consideration of these three principal lines.

The search for a practicable canal route succeeded to the long persistent examination which had caused explorers for so many years to penetrate every inlet from Newfoundland to La Plata, in the hope of finding the strait which they confidently believed nature had provided as a means of communication between the oceans.

"Men," said Humboldt, "could not accustom them-

selves to the idea that the continent extended uninterruptedly from such high northern to such high southern latitudes." From the year (1513) when Nuñez de Balboa first looked upon the wide sweep of the Pacific, a century was occupied in fruitless efforts of gallant and capable men to discover that strait which nature should have placed there—but did not.

The Cabots worked in the north. D'Avila, under secret orders of the Spanish king, scrutinized eagerly the isthmuses and the Spanish main; while De Solis, under similar instructions, explored the coast of Brazil, and while hopefully ascending the great estuary of La Plata, was killed by the natives of that region. Ponce de Leon sailed hundreds of miles northward from Panama on the same errand; Cabrillo and other lieutenants of Cortez groped north and west from Tehuantepec, as far as the vicinity of the present Monterey and San Francisco; and Cortez himself under the urging of his royal master, King Charles V. of Spain, struggled against much obstacle and disaster to achieve the desired discovery. When, however, the Gulf of California was found to have a head at the mouth of a great continental river, the intelligent Spanish explorers, already doubtful, could no longer believe in the existence of any communication between the seas, and the "secret of the strait" faded away into the dreamland of legend and fable. Other nations than Spain still hoped. As late as 1607, we are told by Bancroft, Virginia colonists were ordered to seek communication with the South Sea "by ascending some stream which flowed from the northwest," and that it was in ascending the Chickahominy with this end in view, that Captain John Smith was captured by the natives; and thus another touch of in-

terest is added to the adventurous record of this man of ordinary name and extraordinary life.

The strait was indeed an idea difficult to surrender. It *ought* to be true, they said. The seas are so close together for a thousand miles. Commerce between "Cadiz and Cathay" so greatly needs it. It *must* be so. That it should not be, was, in the words of the writers of that day, "repugnant to the interest of humanity." The "secret of the strait" *must* be disclosed.

Not alone in history are these ardent enthusiasts. In every age some will be found. In our own day we have seen two men of brilliant parts gazing upon the map of Central America with the eyes of conquerors. The one saying "I perceive how useful to commerce would be a canal at Panama. Therefore nature must have intended one. Therefore, nature *did* intend one and I will dig one. And now, *that being decided*, I will enquire as to *how much digging* there may have to be done," what mountains to remove, what torrents to control. Another, also with map on knee, says: "I perceive the commerce of the Mississippi, issuing into the Gulf of Mexico, opposite the Coatzacoalcas River and the Isthmus of Tehuantepec. How natural and simple to traverse the Gulf, and crossing the Isthmus, to proceed to our Pacific States. Nature clearly contemplated this location for a transit route. I will utilize it. And now, with *that settled*, let us see what obstacles to remove, what serious difficulties to surmount. Let us see whether in fact nature did contemplate this location as a transit route." As in that former time, these gentlemen know what nature ought to have done, and therefore know she has done it. How much this false knowledge of the one has cost the people of France can now be ap-

proximately estimated. We have yet to learn at what cost the people of the United States will acquire the same valuable though bitter experience.

The world moving, like all large bodies, slowly toward conviction, did become at last convinced that nature had not pierced the barrier for our use and comfort, and this conviction once forced upon it, plans for an artificial channel began soon to be suggested. The idea had been touched upon by Balboa, Cortez, and Saavedra, but the first record we have of a practical suggestion is that of the Spaniard Gomara, who urged the idea upon Philip II. in 1551,—but the son was not the father; nor were such leaders as Cortez to be found, even had the spirit of Charles V. still animated the actions of the Spanish throne.

From this time forward, the Spanish government seemed disposed rather to smother than to encourage any efforts to connect the oceans. As the old-time Spanish vigor departed, the feeling grew that if any good route were found, it would only be snatched from them by some of those daring Drakes and Grenvilles, who, roaming the seas at the head of brave and reckless companies, sought every opportunity to insult Spain and plunder its colonies.

A long period now passed, during which no interest was evinced in the canal question. The mystery with which the Spanish government had wished to cover it was complete. If the desire for knowledge came later, the failing vigor of that nation stood in the way of any successful investigation.

It was left for Humboldt to reawaken an interest among the nations, and to indicate localities where favorable results would be most likely to be met with by the explorer

and surveyor. In his opinion, the valley of the Atrato and the Isthmus of Darien were points where examinations should first be made. Later we shall see how thoroughly these localities have been surveyed, and with how little success.

In 1825 Nicaragua invited the co-operation of the United States in the construction of a canal by way of Lake Nicaragua and the river San Juan, but with no satisfactory results. In the same year Mexico caused a rough survey to be made of the line *via* the Coatzacoalcos River and the Isthmus of Tehuantepec, resulting in an official report that the "canalization of this isthmus was problematical and gigantic."

Later, in 1828-29, a survey was made under orders from General Bolivar of a route substantially the same as that of the present railway between Aspinwall and Panama. Nothing was effected by this action, except to put an end to the popular error that the mean levels of the oceans on opposite sides of the isthmus differed appreciably. There are still some, I believe, among those who have not given their attention to this subject, who are yet ignorant that differences are caused only by tides, winds, barometric pressures, and other temporary disturbing causes, and that the levels of the two seas may be regarded as practically the same.

Many other attempts were made in the ensuing years, and with uniform lack of success. In 1830 the Netherlands, beginning fairly enough, were obliged by the revolution in Belgium and its separation from Holland to give up the project. In 1835 President Jackson appointed Mr. Charles Biddle as special agent to promote the idea of an isthmus canal, and to visit the Central American

countries for that purpose. Mr. Biddle met with many difficulties, and returned to the United States with nothing accomplished of value, and from this time the projects became too numerous to be even touched upon in a paper of this scope. M. Guizot, under Louis Philippe, urges interoceanic canal questions upon the attention of the Chamber of Deputies. A bishop of San Salvador goes to Rome and urges the importance of a canal upon the Pope. All of no avail; but in 1849 a success is scored, not for a canal, but for the Panama Railway.

This method of transit, of vast service to commerce, has, however, by providing an imperfect system, retarded the realization of that dream, long cherished, of a water connection between the oceans.

We must now, having glanced briefly at the past history of this great problem, make a rapid review of the work of to-day, and consider the various routes which have been examined during the last few years. Although the boiling-down process of precise instrumental surveys has reduced these possible lines of transit to three, Panama, Nicaragua, and Tehuantepec, and although the further boiling-down process of actual digging and building will, it is believed, soon rule out Panama and Tehuantepec, leaving only Nicaragua, yet many other routes, methods, and plans have been examined, and no portion of the isthmuses can be said to have been neglected.

Beginning at the south, we find the Atrato River, recommended by the great Humboldt, rising in the mountains of Western Columbia, and pursuing a northerly course to its mouth in the southwestern corner of the Caribbean. Although its waters empty into the Eastern Sea, its course is parallel to the Pacific coast, and only

about fifty miles from that ocean. The main stem of the Andes, whose eastern slopes it drains, separates it throughout its course from the Pacific. This range is throughout this portion not of great elevation, and numerous tributaries afford, in their valleys, easy grades from the Atrato to or toward the crest of the divide.

Humboldt was told of vessels passing from the headwaters of the Atrato to those of a small stream flowing southwest into the Pacific,—by means of a short canal. Later examinations show that the vessels were canoes, the canal, if not mythical, was a ditch, and that a long and high portage intervened over which the canoes were dragged. Lower down the Atrato several lines of levels were run across the divide with much care and labor, following the lines of some of the principal tributary streams entering from the westward. In these it was found necessary that the summit levels should include tunnels many miles in extent, high enough to accommodate ships with at least the lower masts left standing, and involving enormous expense. Attempts were also made to connect the Gulf of San Miguel with Caledonia Bay on the Caribbean side; and at a point farther west, to connect the Gulf of San Blas on the Caribbean with the Bayano River, emptying into the head of Panama Bay. Here again long tunnels or other formidable obstacles were soon revealed as the lines of levels were carried across.

Next came the line of the Panama Railroad, and here high hopes were entertained, for a railroad was already there, and the Chagres, a large stream, debouching near Aspinwall, has its source well over toward the Panama or Pacific side of the isthmus. After careful surveys on this line it was decided that a lock canal was possible, though

difficult, costing over a hundred millions, and meeting with some trouble in supplying water for its summit level. A canal at the level of the sea was deemed impracticable, it being considered that the violence of the freshets in the Chagres placed it beyond successful engineering control.

The surveys of these routes had been carried on by our government, but the interest felt to-day in the Panama Canal project makes it proper for me to notice other work in that locality, for French enterprise had begun to stir, and a speculative company, known as the "International Society of the Interoceanic Canal," was formed in Paris in 1876. It sent out an officer, of the French Navy, with instructions to search for the best line for a canal within certain boundaries named in his orders. These boundaries were the limits of certain territory in which the society had reason to know they could obtain a concession of land for canal purposes. From the sale of this concession the society hoped for much profit, but was not specially interested in the final success of a great canal company, if first that company should have purchased from their society, at a sufficiently large price, the desired concession. This was not a good beginning, but the instructions to this expedition were submitted to M. de Lesseps, and approved by him.

The individuals comprising this expedition proved to be, in all save engineering qualities, vigorous and enterprising persons. They ran some lines of levels, glanced at some other routes, guessed at the heights of many hills, and at the possible volumes of many streams in time of freshet. On the basis of these data, however, they did not hesitate to make the most elaborate plans and estimates, including minute details.

The real and valuable work done, valuable to the speculators, at least, was shown, however, when they returned to France in 1878, bearing with them a concession, obtained at the capital Bogota, and embracing all routes comprised within the limits of the United States of Colombia. It seemed to matter little to the gentlemen of Paris that no practicable line existed throughout their concession; that their most able engineer, M. Celler, in despair of finding any route for a sea-level canal, had submitted plans for a canal with locks, while admitting that he had but meagre data for it, because he had been sent out to find only a sea-level canal. These mischances affected but little the speculative minds of the International Interoceanic Company. They had obtained their concession; they had, by means known to themselves, persuaded that illustrious Frenchman, whose fame gained at Suez made his name a symbol and surety of success, to cast in his fortunes with them. There was left them only to use that name to form a great Canal Construction Company, which should purchase from them, at a great price, the concession they had obtained from Colombia for a song.

To do this no time was lost. An international conference was held at Paris, under the auspices of the Paris Geographical Society, in May, 1879, for the purpose of deciding upon the best locality for an interoceanic canal.

It is difficult to describe with coolness the methods of this conference.

With seventy-four French members devoted to de Lesseps' interests and ideas, and but sixty-two of other nations; with a "technical" committee and sub-committees crowded with Suez Canal engineers, with a programme specially

arranged to prevent general discussion,—with these precautions it is not surprising that, amid the sturdy protests of such world-famous engineers as Sir John Hawkshaw, of such special experts as Admiral Ammen and Engineer Menocal, the conference should vote with enthusiasm for a sea-level canal between Aspinwall and Panama.

The conference ended, a great company was soon formed; and de Lesseps at its head, by his reputation and his marvellous energy, soon had the needed millions at his disposal, and began the work which we are now watching to-day.

As to its progress: The expenditures are represented by something over one hundred and fifty millions of dollars; while M. de Lesseps claims from twelve to fourteen per cent. of the excavation completed, and unprejudiced engineers claim only six to eight per cent. completed. He holds that the time already occupied, five years, has been so well spent in preparation, that three years more will complete the work. Neutral parties of intelligence announce that it will be impossible to complete it before the year 1900, even under most favorable circumstances. But the circumstances cannot be favorable. The charges of interest upon money already spent will be an unceasing drain upon money yet to be received. Torrential rains must continue to fall during the rainy seasons. The problem of the unruly Chagres remains yet unsolved.

We cannot doubt the brilliancy of de Lesseps' vigorous intellect. His long career vouches for it. But Napoleon was brilliant, and yet committed the foolishness of invading Russia. He was great, but he had his Waterloo. De Lesseps is great, but he has his Panama.

Let us pass now to the north and west, to a locality where nature seems to have made, if not a perfect site, at

least a disposition of land and water more favorable than at any other point, for a water transit between the oceans. Here the backbone of the continents and isthmus, running parallel and close to the Pacific shore, sinks to its lowest point, while its eastern slope is washed by that great sheet of inland sea known as Lake Nicaragua. At this low point the divide is less than fifty feet above the level of the lake, and about one hundred and fifty feet above the mean level of the Pacific. Though the western shore of the lake is but fifteen miles from the beach of the Pacific, the lake drains through the River San Juan, into the Caribbean Sea. The lake is deep and unobstructed, and the river, already navigable for light-draught steamers throughout most of its length, requires but a little labor to deepen it.

Here, with such a vast water supply at the summit, with the lake itself as a summit level, nature seems indeed to have offered assistance in connecting the oceans. No great engineering difficulties in utilizing the lake are claimed even by opponents of this route. There are no startling propositions connected with the plan. A large dam is to be built in the river San Juan, to back the water in the river up to the lake, but it is a simple matter of known engineering methods. A lock of exceptional lift is to drop the canal at the west end of the summit level a distance of fifty-two feet. The dimensions and strengths of the parts of this great construction must, therefore, be specially arranged to withstand great strains, but if objection is made to its size it is quite a simple matter to distribute this descent among two or three locks instead of one large one.

It is not to be expected that estimates can be very

exact in a great scheme of proposed work, but about these plans there is nothing new or strange. We have here a minimum of unknown quantities. The estimate is about \$50,000,000, and \$75,000,000 is proposed for capital, but if it cost \$200,000,000, we have a tonnage in the beginning which will pay six per cent. upon the investment, and the tonnage will increase largely. There can be no doubt that besides the ships now needing the canal, a great additional commerce will be created by the existence of such transit.

The scope of this paper will not permit much discussion of detail, but new advantages appear at each examination of this route. In the act of constructing the canal we are, at the same time, harnessing and making subservient to our needs a water power of enormous capacity; supply continuous and inexhaustible, with a head of 110 feet of elevation. And this at a point where the products of the world, the raw materials and the manufactured, meet in their passages between Alaska, California, China, Australia, Peru, and Chili on the one hand, and Europe, Africa, and the United States on the other. At a point, too, where the salubrity of the climate, and the fertility of the surrounding country, will give favorable chances to great undertakings.

What vast opportunities are here disclosed! What an *entrepôt* for the coffee and sugar of Costa Rica and Nicaragua, the guano of Peru, the lumber of Alaska, the grain of California, meeting the cotton of our South, the manufactures of the United States and Europe! What factories, mills, ship-building industries may we not see in the near future along the line of the canal and upon the great lake itself!

The mind grows weary in reviewing the long array of possibilities which nature, in its kindest mood, has placed in this favored spot for the use of man.

Referring briefly to the lines in Costa Rica and Honduras, the former connecting Chiriqui Lagoon with the Gulf of Dulce, and the latter crossing from the Bay of Honduras to the Bay of Fonseca, they may be summed up by stating that excellent locations for railways were found here, with good harbors at the termini, but that the elevation of the mountain range in this vicinity made canals impossible.

Passing on still farther to the north and west, we come to the last of the isthmuses, that of Tehuantepec.

Cortez satisfied himself with regard to its usefulness as a land transit, and sent by that line much of the equipment arriving from Europe for his Pacific fleets fitting out for exploration and conquest. Later on, when no longer used, the world fell again into ignorance concerning it, and the ancient legends of a strait existing here gained a fresh credence until as late as the middle of the last century. In our own time, the scramble to get to California in 1849 caused it to be used once more, and to the routes known as "around the Horn," "across the Isthmus," "over the Plains," was added this one under the name of "through Mexico."

This route demands at my hands something more than a passing notice, for in our present Congress vigorous efforts are being made by Captain Eads to obtain government assistance for a project to carry ships from ocean to ocean across Tehuantepec, upon a railway. Resting his claims for notice, as does the eminent Frenchman, upon past services of unquestioned merit, Captain Eads ad-

vances, as the crown of his engineering career, a scheme which on its face is of doubtful practicability, and which, if proved practicable by the expenditure of vast amounts of money, labor, and ingenuity, can still be shown to be wholly unnecessary. He proposes, as a canal here is impossible, to take sea-going ships, loaded with heavy cargoes, out of the water, lift them upon a cradle, and carry them by rail across 650 feet of elevation, through swamps and across streams, and finally to lower them into the water on the other side of the isthmus.

The mass of engineering opinion regards the building of embankments, the management of grades and turnings, to be, under this heavy load, difficult and dangerous—perhaps impossible. The mass of nautical opinion considers the lifting and carrying of heavy ships, loaded with railroad iron or other heavy weights, to be dangerous in the highest degree to the integrity and safety of the ships' hulls. This gentleman, though, is able, and possesses an ingenious mind. Perhaps he can, at enormous expense, carry out his plan. But why does he wish to do it? Simply to avoid the breaking of bulk—the discharging cargo and loading cars, the discharging cars and stowing cargo—the two handlings of freight, in fine.

There is more than one way of avoiding this breaking of bulk easier and simpler than that he proposes. Ships for this isthmus trade can be easily fitted with interior decks on which rails are laid for cars of the lightest and snuggest construction, stowing closely together, and losing but little stowage room by their interstitial spaces. Cargo may be stowed in them, and these cars, of a size to fit a narrow-gauge road across the isthmus, can be hauled out through the bow or stern ports, in a dock arranged to float

the ship higher or lower, as needed, in order to bring its decks in succession at the level of the shore tracks.

These cars would be run across a cheaply constructed narrow-gauge railway, and run into the hold of a ship on the other side of the isthmus, fitted in the same way to receive them.

Some little stowage space would, of course, be lost, but this loss would be slight compared with the enormous tolls each vessel would have to pay to allow dividends on the expensive railway needed to carry bodily a large vessel and her cargo.

I do not claim that this is a specially good project; but only that it is one of many plans which are more feasible, economical, and sensible than Captain Eads' present scheme.

These remarks, to which you have kindly listened, will have shown you that only three localities have been considered as worthy of being tried: Panama, Nicaragua, and Tehuantepec. You will also have discovered that some persons, myself among the number, believe Nicaragua the only route for efficiency and economy. Did nature, however, offer opportunities for constructing canals at each of these localities, they would all be more or less favorable for the use of commerce, compared with the long and expensive voyage around the Cape of Good Hope or the Horn. Tehuantepec, could it be used, would best serve the coastwise traffic which would be established between the Gulf of Mexico and our Pacific States. For all other traffic of this country and other maritime nations, the more southern routes would be preferable, and between the two, Panama and Nicaragua, Panama would be avoided by a large proportion of the traffic,

namely, the sailing ships, owing to the continuous calms which prevail for hundreds of miles to seaward from that port. The estimate of the amount of tonnage passing through the Nicaragua canal when first opened, was about four millions of tons per year. This estimate, the mean of several reliable calculations by eminent experts, was based upon the figures of the world's shipping trade in 1870. It may now, with justice, be raised to five millions of tons. Upon this tonnage, at a rate of \$2.50 per ton, which is about the rate of toll through the Suez Canal, \$12,500,000 would be the gross annual revenue. In the estimates for a Nicaragua Canal, \$500,000 has been allowed for the working expenses annually, and this would leave a net revenue of \$12,000,000 with which to pay the interest upon the cost of construction. What that cost will be is known quite closely in the case of Nicaragua. Work would not be started here in the ignorance which marked de Lesseps' beginning at Panama. Careful instrumental surveys have been made, borings have been sunk, both by land and water, to learn the quality of the cube to be excavated, and where obstacles have prevented exact knowledge, the cubes have been estimated for as solid rock. The estimate for a canal at Nicaragua, larger than that at Suez, is about \$50,000,000, and to this 50 per cent. has been added for all contingencies, making \$75,000,000.

Though many able engineers believe that it can be built for much less, I believe that sum will represent very closely its total cost. What Captain Eads' project of a ship railway will cost, no one seems to know. His idea is so problematic that no reliable estimate can be formed. Seventy-five millions is mentioned by Captain Eads.

Careful surveys will no doubt make the estimate much greater, especially when we consider the costly equipment needed to carry its heavy burdens. But if it costs only as much as the Nicaragua Canal, it is to be remembered that the working expense of railroads is over fifty per cent. of their gross revenues, and of such an abnormal railroad as this is they would probably be much greater. If these twelve and a half millions represented the total revenues, from four to five millions is as much as could be expected for net revenues from a ship railway. Now judging by the small percentage of gross receipts needed for the working expenses of the Suez Canal, embarrassed by the drifting sands and burdened by a costly home administration, we may reasonably expect a half million of dollars to cover the annual working expenses of a completed Nicaraguan canal, leaving a net revenue of twelve millions, or sixteen per cent. on the cost of construction.

Of the final cost of de Lesseps' sea-level canal at Panama, if there could be any thing final about it save utter failure, nothing can be known, except that it will be a fabulous amount. A fresh debt of one hundred and twenty millions of dollars has lately been incurred. This loan was offered to subscribers at forty-five per cent. (450 francs for a 1,000-franc bond), but the cost of placing this loan will, it is believed, reduce the amount to thirty-nine per cent.; or to about forty-seven millions for the one hundred and twenty millions. It is believed, with good reason, though the debts of the company are difficult to ascertain, that about one-third of this amount is already owing to contractors and others for work already done. So that without considering interest on its enormous obligations, the company will have but a small portion of this

new loan to apply to work upon the canal. These obligations now amount to a sum little short of three hundred millions of dollars, and with this huge debt staring them in the face, I can say without exaggeration, that the great difficulties and expenses of excavation are all still before them, and the knotty, perhaps impossible, problem of the Chagres River is still unsolved.

Do not, I beg you, permit this showing of the Panama Canal to influence you against *any* canal between the oceans. These facts do not surprise those who have studied the question. Great engineers warned Paris and the world of just such a disaster at the Paris Congress, while they urged Nicaragua upon their attention, as being an entirely feasible, economical engineering project. We know why they were not listened to; we know how the French clustered loyally about their famous de Lesseps; how he, totally ignorant of the topographic and climatic difficulties, flushed with success and impatient of contradiction would hearken to nothing but a French plan, executed by Frenchmen. Do not, therefore, let this influence your minds against a plan and route recognized as practicable for centuries, and already so closely surveyed as to leave no element of doubt as to its engineering qualities, its small cost, and its final value; for such is indeed a temperate description of the route by way of Lake Nicaragua and the River San Juan.

We have now considered the three lines and methods before mentioned, by which the oceans may be connected: Panama, a sea-level canal, Nicaragua, a canal with locks; and Tehuantepec, a ship railway.

By way of the Panama Isthmus a canal with locks could have been constructed. It would have been ex-

pensive; vexatious problems would have presented themselves in supplying water to its summit level. Nevertheless it was a possible, though not attractive, engineering problem.

Attempts have been made, however,—disastrous attempts—to construct a canal at the level of the sea at this isthmus. This project, impossible as an economy, impracticable as an engineering scheme, has, by its failure, made it improbable that a canal of any kind can, during this century, be made successfully at Panama.

The route for a canal with locks through Nicaragua, using the lake as a summit level, presents itself most favorably, both as an engineering and an economical problem; a scheme which, as far as we can judge, seems specially favored by nature.

The line by way of the Isthmus of Tehuantepec, if a canal were possible there, would commend itself to the commercial interests of the United States on account of its northern location, making the transit between our Gulf and Pacific States a most convenient and speedy one. So far as is known this water transit cannot be provided. The ingenious conception of a famous engineer may perhaps have there a practical trial, and an effort may be made to carry loaded ships of the largest size on a railway more than a hundred miles long, and which achieves over six hundred feet of elevation in its passage between the oceans.

The ship-railway project is born of a keen desire to utilize this Isthmus of Tehuantepec for commerce. It does not arise from any manifestation of nature in favor of its use for purposes of a transit route. More than this, the world generally has not asked for a railway, but for water transit—for a canal.

To those, then, who, like myself, are assured of a Nicaragua Canal in the future, it may be of interest to consider it with reference to the United States. We have spoken of its importance to our commerce. Let us now glance at its value from a military and naval standpoint.

From a point of view, strategic and political, it may be said that if this canal were the southern boundary of the United States, our need to hold it would be overwhelming and unquestioned. To permit a feeble race of people with an uncertain government, such as occupy almost all the western hemisphere south of this country, to control a boundary canal, would soon result in the swallowing up of that feeble nation and of the canal control by some European power, strong and aggressive. Such joint possession as happens with a part of the St. Lawrence River, where another great nation owns the other bank, would not be practicable, if it were Nicaragua or Costa Rica confronting us there. Were the Rio Grande a great channel of navigation, connecting our Eastern and Western States, instead of the unimportant stream it really is, we could not permit even our neighbor Mexico to have a part in its control. And what is true in this supposed case is the more so when, in reality, between us and the proposed canal there lie intervening countries, all of them feeble and liable to be easily dominated by an outside power.

There is, in fact, no locality favorable to an interoceanic canal which could be any thing but a passage, a narrow thoroughfare, connecting two of our great divisions, our Atlantic and Pacific States.

Further, we are pledged by our traditions to protect the states of Mexico and Central America from European

aggression. It is plain that we must abandon those traditions if we are not to control a great artificial channel penetrating the very heart of Central America, and passing from sea to sea.

These reasons for our holding the canal would apply in the case of a canal along any practicable route, but much more in the case of one through Nicaragua, for if that route be followed the construction of the canal at once establishes in the lake, in addition to the water transit between the oceans, a grand interior fresh-water harbor within a few hours of either ocean. As a base from which to dominate and control both coasts and the West Indies, the strategic value of such a harbor is beyond estimate. Absolutely sheltered and secure, its fresh water constantly tending to cleanse the ships' bottoms, its lofty islands offering such sanitary opportunities that no tropical sickness need ever prevail, this great lake, with anchorage for the world's fleets, seems to thrust itself upon the attention of intelligent engineers as the only solution of the transit problem; while to the naval officer, who sees in the near future the necessity for the United States to control with its fleets the coasts and the great archipelago to the south of us, this capacious interior basin offers itself as harbor, depot, strategic base, making such control possible and simple.

It seems idle to argue as to whether it be wise or expedient to obtain this domination. Whether right or not, great nations always do control affairs of the feeble and unprotected in their vicinity. Whether we seek it or not, this domination will be forced upon us throughout those regions and seas which lie near us in the South.

Nature has defined the limits of such areas as should,

from duty and policy, be of special interest to us. The Caribbean Sea, Gulf of Mexico, West India Islands, the shores, east and west, of Mexico and Central America, and the Spanish main,—these must be cared for by fleets in peace, and fought for by fleets in war. Beyond this our influence and interest, physically and geographically speaking, need not extend. Except its north shore, South America is quite removed from us and our interest. Pernambuco and Rio de Janeiro are nearer to Spain and Portugal than to New York and Pennsylvania in actual distance, as well as in language and sentiment. We need not dwell upon this question. A careful inspection of the map of the western hemisphere forces the conclusion upon us that a nation occupying the present position of the United States must, if it lays claim to greatness, be dominant in the Caribbean, the Gulf of Mexico, and the neighboring islands and shores. These are the passage ways, if not, some day, the ultimate destinations, of the richest products of our industry, floated southward from our great central region, and passing through Mobile, New Orleans, and Galveston to the sea. Duty and interest, then, seem to demand that we prepare for this control in the future. It is more than a consequent of greatness, it is greatness itself; it is part of the definition—we cannot be a nation of the first rank while lacking the control of the seas and coasts immediately south of us.

From a naval and military point of view, therefore, the direct advantage of holding such a great base of operations as Lake Nicaragua is immense—is, perhaps, when we consider all the circumstances, without parallel in history. If we consider the unhealthiness of the harbors,

coasts, and navigable rivers of the Caribbean region, and, on the other hand, the comparative immunity from disease to be enjoyed by a fleet occupying the elevated waters of this fresh-water lake, with hill slopes on its islands reaching far above the yellow-fever line; if we note the rapid destruction of iron ships' hulls in seawater, the alarming fouling of barnacles and grass, and consequent serious decrease of speed, frequently reducing a fourteen-knot steamer to eight knots; and if we then reflect upon the quick remedy which fresh water always affords in this difficulty; if we consider the admirable strategic position of the lake, and regard its size and depth—so great as to permit the largest fleet to drill itself to the highest evolutionary efficiency;—these and numerous minor details, if well considered, will not fail to convince us of the value of this great possible depot and station.

A well-appointed dockyard would be established on the shores of the lake, or on its lofty island of Ometepe. Hospital sites and camping-grounds for the crews of vessels would be selected close to the fleet's anchorage, but well above the fever line, on the mountain slope, in a bracing and healthy air. Store-houses and hulks, coal piles and elevators, would give facilities for the rapid coaling and provisioning of the fleet. Stone dry-docks along-shore, and floating docks sent from the United States in sections to be put together on the lake, would offer opportunities for the quick repairs of damages sustained in battle. Telegraph cables would connect the station with Washington, and railways through Mexico, always available in peace, would be easily made so in any war against European powers. It is well to note here, as an important

item, that such a government establishment, always kept ready for a war, would not, during the long intervals of peace, be expensive. The nautical needs of the merchant marine are so nearly those of men-of-war, that a dockyard of the first class, with all its repair shops and provisioning facilities, could be kept fully employed and in a high state of efficiency during a peace, however long; and this at no expense, no running expense, to the government, but, on the contrary, at a handsome annual profit.

Here, then, in this secure, capacious, and healthy retreat, within a few hours of the open ocean, let us see what would be the capacity for reaching out possessed by a fleet in this stronghold. If the speed of a fleet be fifteen knots, it can in two and one half days, from the canal entrance, reach the Yucatan Channel, south coast of Cuba, Windward Passage, Jamaica, and as far east as Maracaibo on the Spanish main. In five days it may be off the mouths of the Mississippi and Rio Grande, in the Florida Strait or among the Bahamas, in the Mona Passage or at Martinique and Barbadoes, and include in its reach to the eastward the whole of the Spanish main.

On the Pacific side, in five days, at full speed from the entrance of the canal, the fleet can arrive in the mouth of the Gulf of California in one direction, or upon the coast of Peru in another.

It will thus be seen how long would be the arm, how effective the power of a swift and well-conditioned fleet, ready to act on either coast, and drawing constant strength and nourishment from this admirable lake base. With a strong naval force in Hampton Roads, another in California, ready to move effectively at a moment's notice, then a similar fleet in Lake Nicaragua would complete

what may be called the naval strategic defence of our nation. There would be many additional details in any complete scheme of defence. Key West must be held, and the mouths of the Mississippi protected; a strong force, auxiliary to the Hampton Roads fleet, must hold the sounds and channels of Long Island and Nantucket; Puget Sound must be held, and the Gulf of California dominated.

The three great divisions of our fleet, to protect our coasts and our vital interests to the southward, must, however, hold positions similar to those above mentioned, in a large and well-considered scheme of strategy.

It would be possible for the Lake Nicaragua force to join the Hampton Roads fleet and engage an enemy's off Havana, and thence, allowing two days for coals and provisions in the lake, it could join the California fleet off Cape St. Lucas, and fight an enemy in the Gulf of California, and this within twelve days of the first battle.

These possible movements and combinations need not be dwelt upon; one such example as the above is sufficient to indicate the value of such a naval base as Lake Nicaragua and its many strategic combinations.

I may now be permitted to assert that the route for a canal by way of Lake Nicaragua and the river San Juan, when viewed commercially, is far superior to any other means of connecting the two oceans at present known, but that added to its advantages, financial and engineering, it has, when viewed in a naval and military aspect, an eminent fitness which is at once apparent.

Let me ask your forbearance for a few moments longer, while I quote some sentences from a remarkable pamphlet written in 1846 by Louis Napoleon, afterwards Emperor of the French. It is as follows:

“The geographical position of Constantinople is such as rendered her the queen of the ancient world. Occupying as she does the central point between Europe, Asia, and Africa, she could become the *entrepôt* of the commerce of all these countries and obtain over them an immense preponderance; for in politics as in strategy, a central position always commands the circumference. This is what the proud city of Constantine could be, and this is what she is not, because as Montesquieu says, ‘God permitted that Turks should exist on earth, a people most fit to possess uselessly a great empire.’ There exists in the New World a state as admirably situated as Constantinople, and we must say up to this time as uselessly occupied. We allude to the state of Nicaragua. As Constantinople is the centre of the ancient world, so is the town of Leon the centre of the new, and if the tongue of land which separates its two lakes from the Pacific Ocean were cut through, she would command by virtue of her central position the entire coast of North and South America.

“The State of Nicaragua can become, better than Constantinople, the necessary route of the great commerce of the world, and is destined to attain an *extraordinary degree of prosperity and grandeur*.

“France, England, and Holland have a great commercial interest in the establishment of a communication between the two oceans, but England has more than the other powers a political interest in the execution of this project. England will see with pleasure Central America becoming a powerful and flourishing state, which will establish a balance of power by creating in Spanish America a new centre of active enterprise, powerful enough to give

rise to a great feeling of *nationality*, and to prevent, by backing Mexico, *any further encroachments from the North.*"

These utterances of a man of thought, this evident fear of the Eagle in the North, are significant. To this student of large enterprises, the pre-eminence of Lake Nicaragua, politically and commercially was quite plain, forty years ago. He could not think that the eyes of this eagle would lack the proverbial keenness of vision, that the great Republic would have that political control pressed upon it, that commercial power freely offered to its citizens—all of it only to be rejected with cold indifference.

What is it we are doing, my friends, in rejecting this control? Are we blind to the strides the Germans are making toward commercial supremacy in Mexico and Central America? Is there no significance in the loans which English capitalists are freely offering to Nicaragua to improve the navigation of her river and lake? These things tend but one way. The English merchant, the German chancellor, the French engineer—they know what these things mean, they know what their nations need for their development. It is only we that do not know. It means *Empire*, ladies and gentlemen—the control or possession of this canal means *Empire*. It is to our wealth, our development, our supremacy as a nation among nations, what India, and more than India, was to English merchants, and to the English crown and nation. It means the guiding of the great Pacific's wealth into New York rather than Liverpool, into New Orleans instead of Marseilles. And we,—we also will learn this some day, when alas! some other nation has seized the golden key as it drops from our listless hand and with it unlocked for itself the door to wealth, fame, and power;

when another nation has built and holds the Nicaragua canal; then will we learn and know, and *then*, the hand that dropped the key must grasp the sword in its place and so win back the key—and again will precious blood and treasure be wasted in long wars to regain that which with slightest effort and to our great profit we might now peacefully retain.

Surely our commercial public should be anxious to secure for themselves the building of this canal in the interests of trade. Surely our national government should be quite as urgent to hold a controlling interest in it, as a pillar of strength in peace and in war.

Nicaragua has cordially offered to our government canal rights of inestimable importance. It is not for us to know what wise reasons caused our government to decline this offer. Nicaragua has now and for years offered to certain of our citizens a liberal concession for the construction of a canal. These citizens are to-day unable to accept this offer, though anxious to do so, because the fatal apathy of our capitalists and merchants denies to this project the assurance of financial support. So blind are they to the immense profits accruing from this project, both to themselves and to the country, and yet so keen to see smaller gains in smaller and less secure enterprises, that we are driven to believe at last the old story of the man who saw with ease the flies on the barn door, but could not discern the door itself.

Fortunately, light is now dawning, and there is good reason to expect that the next few months will see American citizens of wealth and reputation entering upon this great project, and identifying themselves with this, the greatest of peaceful achievements known to our century.

Let us hope that it will come by peaceful means, that in this instance "grim-visaged war" will not enter into the problem, but that the great canal may draw nations closer together in the bonds of peaceful trade and of enlightening commerce. Let us think of it as doing for us what we so sorely need, building up for us a vast coastwise traffic of sea-going ships between our Atlantic and Pacific coasts, leading surely to a new birth of that great American shipping which died in our civil war. Let us, looking hopefully into the future, see the canal bringing nearer to us the brave republic of Chili and its neighbors, see it binding Australia and New Zealand to England, Manilla and the Philippines to Spain, see it, in fact, bringing the whole Pacific close to our doors and to Europe, and making most true and forcible the old motto of ocean commerce, that

"The seas but join together
The nations they divide."

TEHUANTEPEC SHIP RAILWAY (proposed)—

Length, 134 miles.

Probable cost of construction, \$100,000,000.

Probable receipts (gross) \$12,500,000 ; (net) \$4,000,000.

NICARAGUA CANAL (proposed)—

Length (canal) 40 miles ; (river and lake) 130 miles.

Locks, 7.

Floor of canal, 80-120 feet wide.

Surface of canal, 80-300 feet wide.

Depth, 28 feet.

Probable cost of construction, \$75,000,000.

Probable receipts (gross), \$12,500,000 ; (net) \$12,000,000.

SUEZ CANAL (completed)—

Length, 99.9 miles.

No locks—à niveau.

Floor of canal, 72 feet wide ; surface, 190-328 feet wide.

Depth, 25 feet.

Tonnage using the canal in 1883, 5,775,861 tons.

Receipts from tolls during 1883, \$13,702,413.

Cost of construction, \$93,000,000.

PANAMA CANAL (constructing)—

Length, 46 miles.

No locks—à niveau.

Floor of canal, 72 feet wide ; surface, 100-164 feet wide.

Depth, 28 feet.

Probable tonnage, if canal is completed, 5,000,000 tons.

Probable receipts, " " \$12,500,000.

Probable cost of construction, \$500,000,000.

SAVING IN DISTANCE AND TIME BY NICARAGUA CANAL :

	Miles.	Gain for Sailing Ship— Days.	Gain for Freight Steamer— Days.
New York to Hong-Kong . . .	2,450	27	12
" Yokohama . . .	4,200	40	21
" Callao . . .	4,390	52	22
" Honolulu . . .	7,100	67	35
" San Francisco . . .	7,370	72	37

NOTE.—The following-named persons, desiring to organize a company for the purpose of constructing the Nicaragua Canal, have recently applied to the United States Congress for a simple act of incorporation: Frederick Billings, Charles P. Daly, Francis A. Stout, Horace L. Hotchkiss, Wm. L. Merry, Edward F. Beall, W. B. Franklin, Sheppard Homans, Daniel Ammen, Jas. H. McMullan. Additional information on the subject of the proposed enterprise will be gladly furnished by any of these gentlemen.

HUDSON BAY COMPANY, 1670-1870.

SUMMARY OF A LECTURE READ BY

DR. GEORGE E. ELLIS,

PRESIDENT OF THE MASSACHUSETTS HISTORICAL SOCIETY.

The paper on "The Hudson Bay Company, 1670-1870," read before this Society, November 18th, was an abstract of a fuller manuscript on the same subject, prepared as a chapter to be printed in one of the forthcoming volumes of the "Narrative and Critical History of America." That being the original and ultimate purpose for which the manuscript was written, even the abstract of it, as delivered before the Society, cannot with propriety anticipate in print here its final publication. The writer can offer in these pages only a condensed summary of the historical review of his whole subject.

On the first discovery of the "New World," and the subsequent development of portions of its territory as sighted by navigators coursing its coasts, the Pope of Rome and temporal European monarchs hastened to assume and dispose of rights of possession and dominion here, according to the principles of what was then accepted as international law. Countries newly discovered—the rights of their occupants being wholly overborne for the reason that they were heathen—were regarded as coming lawfully under the ownership, dominion, and disposal of the respective European rulers, whose subjects, as mariners or adventurers, had first

sighted the land from the sea. Under this assumption, the Pope, as the sovereign of all earthly sovereigns, bestowed the whole of the New World upon the crowns of Castile and Leon. These earthly sovereigns, however, were swift to claim, appropriate, and bestow upon their respective subjects portions of this vast whole, to which they could set up any rights founded on discovery. Before there was any certified knowledge of the extent, features, and qualities of this New World, as to whether it were an island, an archipelago, or a continent, royal liberality was most lavishly exercised in granting proprietary and monopoly rights upon it to individuals and to companies, opening rivalries and conflicts on attempts at occupancy and possession. The rights which these sovereigns claimed were based upon their prerogative as "Christian Princes," overruling the actual possession by "heathen people." The inference would be that these "Christian Princes" would respect each other's claims, whether founded on prior discovery or occupancy. But such did not prove to be the case. The necessary vagueness of the terms of donation, and the partition by boundary lines embarrassed even the most fair conditions of the gifts. Charles II., of England, made a most lavish use of this kingly prerogative in bestowing obscurely known territories with monopoly rights of occupancy, trade, and government. In 1670 he gave to his cousin, Prince Rupert, with less than a score of associates, mostly nobles of the highest rank, a charter conveying the region afterwards to be called "Rupert's Land," lying around Hudson Bay, being the land whose waters drained into that icy sea. The gift was made by the king's "especial grace, certain knowledge, and mere motion"; and as not having the

authority of Council or Parliament, the legality of the charter was afterwards continually brought under question among the many other reasons for the controversy with the Company. The representation of the high nobility in the very limited number of the shareholders of the franchise was continued in the Company through its history, and was of powerful influence in protecting it from assaults and in shielding its management from attempted scrutiny. Subsequently the Company obtained for limited periods of time rights in the so-called Northwest Territory, and when there was added Vancouver's Island, it had under its administration a region one third larger than the area of Europe. The monopoly was a giant one, and it was most jealously guarded against persistent inquiry and opposition. Its profits were enormous. Its original capital was £10,500. From constant watering, with very slight assessments, and notwithstanding great losses from contests with French rivals, the capital increased to £500,000, with annual dividends, often of seventy per cent. The business affairs were administered in London by a governor and associates, while its local management here was through a resident governor and a council, with a gradation and a mode of promotion among its servants. These were originally Scotch youth from poor and rough homes in the Orkneys. These youth gladly availed themselves of the opportunities of a wild life of adventure in the labors of the fur trade, seated at their desolate posts by lake or river in the interior. Their first aims were to acquire wealth for a return home. But generally the fascinations of their surroundings and experiences induced a second nature, which retained them here mated with Indian or half-breed com-

panions. Their pay in money—sustenance being provided—was faithfully kept at interest for them by the Company, and maintained them in their retirement.

For many years the Company had posts for collection of furs brought in by the Indians, and for barter with them, only at the mouths of Nelson and Hayes Rivers on the Bay, and at the mouth of Moose River on James Bay. Afterwards it extended its posts, forts, or factories in all directions through its territory in the interior. The water-ways in the open season were admirably suited for its traffic. In the winter dog-sleds served the purpose. Peltries were brought in twice in a year and stored at the posts, to be sent to the London warehouse. At first one vessel annually, afterwards two, came through the icy waters, remaining through a summer month for a change of cargo.

The literature relating to the history of the Company is voluminous, and may be distributed into two classes. In the first of these, gathered in several special libraries, is a series of curious and very interesting volumes written, for the most part, in the wilderness by the more intelligent servants, apprentices, and employees of the Company. These works have the tone and flavor of the circumstances and surroundings amid which they were written, to beguile leisure. They are narratives of adventure and experience. They give us revelations of the alternating solitary and exciting scenes and incidents attending upon life and occupation at lonely posts, on expeditions, and upon the hilarious and boisterous gatherings at some of the more central stations, when brigades of trappers and voyageurs arrived with their loads of peltry. The methods of travel by the water-ways or by

sleds, with their pleasures and perils, are picturesquely presented, and the terrors, resources, and employments of wintering life cover many graphic pages. We have full descriptions also of the conduct of the barter trade with the Indians: the exchange of peltries for European goods at the posts; the pandemonian orgies of the drinking bout which preceded this exchange; the scenes and concomitants of the Indian camp; and then, after the trade had closed, the parting of the motley crews in various directions, either to engage in a buffalo hunt for procuring pemmican—the staple food alike of dogs and men—or to distribute themselves, generally one by one, occasionally in couples, with their traps, to circumvent the beaver, the otter, the fox, the marten, etc., in their favorite haunts. These unique volumes would be a most fascinating feast for boys fond of daring adventure faithfully related.

The other class of literature relating to the affairs of the Company, is a record of quarrels and controversies, involving contests with the French and rival fur companies, contentions incident upon the settlement of the Earl of Selkirk's colony on Red River, founded in 1811, and inquiries instituted before committees of Parliament, as instigated by the embittered enemies of a greedy and grasping monopoly. Though one of the objects of the Company, as avowed in its charter, was the exploration of the country, not only did the Company wholly fail to pursue this, but it sternly opposed such enterprise by others. After the cession of Canada by the French, other British subjects claimed rights against the monopoly. The interested witnesses in defence of the Company before the committees of Parliament, were not only stiffly

reticent about its secrets, but prevaricated sadly in testifying that a region, now the most fruitful grain-bearing country in the world, was hopelessly sterile. It was proved that the Company had debased the natives, was a barrier to the expansion of the Dominion of Canada, and was bent upon keeping a territory where millions of civilized beings might live prosperously, as a mere wilderness preserve for fur-bearing animals.

The time at last came to break this towering and defiant monopoly. Two centuries had been enough for it. Measures initiated in 1867 by Parliament empowered the Queen to accept a surrender on terms. Earl Granville, the Minister, opened correspondence with Sir Stafford Northcote, Governor of the Company, in March, 1869. The occasion and grounds of the transfer were: That the vast regions of the Company were without a recognized government capable of enforcing the law and responsible to neighboring countries for the performance of international obligations; and that this state of things invited trouble, as mining and agricultural settlers, pressing in from the outside, interfered with Canadian development. The object was to annex all British North America (except the Colony of Columbia) to the Dominion of Canada.

The reasons which were to have weight with the Company, were: that its title, long disputed, was now vigorously assailed; that serious questions had arisen as to boundaries; that the territory was liable to the irruptions of Canadians and Americans; that these were not to be withstood, as the terms of the charter and their internal constitution did not qualify the Company to maintain order and administer government.

"There must be compromise," said Earl Granville, "though the terms of it are admitted to be difficult. The Company's estimate of its rights is not acquiesced in by others concerned. A court of law is the only alternative to the proffered compromise. Therefore a proposal is advanced intended to be impartial, to be submitted to the Canadian authorities and to the Company—though not likely to meet the expectations of either. Such as it is it is offered with the understanding that it is final, not subject to modifications or qualifications.

1st. The Company is to surrender all specified rights of property and government in Rupert's Land, and in other parts of British North America, to the Dominion of Canada.

2d. The Dominion is to pay the Company £300,000.

3d. The Company may select and hold blocks of land adjoining its stations, not exceeding in all 50,000 acres.

For fifty years to come, as surveys are advanced in the "Fertile Belt," the Company shall have one twentieth part of the land. The bounds of this "Fertile Belt" shall be: South, the United States Line; West, The Rocky Mountains; North, the Northern Branch of the Saskatchewan; East, Lake Winnipeg and the Lake of the Woods."

All the titles of land previously given by the Company were to be confirmed, and it was to be at liberty to continue its trade in its corporate capacity. The Company tried, but failed, to induce the Dominion to accept some modifications, as, for instance, to allow it $\frac{1}{10}$ instead of $\frac{1}{20}$ of surveyed lands. These portions of land, in surveyed townships, were to be claimed within fifty years. It is probable that within that term all the

specified land will have been surveyed. Two years ago, the portion thus surveyed amounted to 61,863,772 acres, of which the Company receives, 3,093,188 acres. This, it is to be understood, is in addition to the 50,000 acres around its posts.

The Company has withdrawn some of its posts, as that at Fort William, Lake Superior, and that at Rat Portage, head waters of Winnipeg River. Others of its posts it has turned into general wholesale and retail stores, for miscellaneous business,—as at Winnipeg, where is a vast establishment. The Company has ceased to collect furs near the more open and railway regions, and confines that trade to remoter places round the Labrador coast, toward the shores of Hudson Bay, at Fort Churchill and Moose Factory, to the Arctic and north of Athabasca, along the Great Slave Lake and the line of Mackenzie's River, towards the Rocky Mountains.

While thus hardly decreasing its activity in its original business, it has added another, very brisk and profitable, in the sale of land, for which it has a flourishing agency at Winnipeg, apart from its store for traffic.

In the report of the Company for 1882, the profits of the fur trade are put at £70,829.10, and the receipts from land sales at £143,245.1. The sales of land up to that year had brought in to the Company about \$3,250,000.00. The other property, which may be regarded as capital, is about £2,000,000. That the fur trade is still an important one may be seen by the following figures, taken from the report of the Company's sale in London in January, 1884 :

Beaver skins, 104,120; musquash, 1,075,346; American rabbit, 13,595.

The lecture was illustrated by many stereopticon views of scenery, the posts, or forts of the Company, and of natives in their life and occupations.

At the close of Dr. Ellis's lecture, Judge Daly, President of the Society, rose to express the gratification with which he had listened to the clear and interesting account, given by the lecturer, of the history and organization of the powerful Company that had so long ruled with an iron hand the greater part of British America. He had himself paid a great deal of attention to the progress of discovery and the reports of travel in that vast region, and his studies had led him to some of the conclusions arrived at by Dr. Ellis.

Judge Daly recalled a visit which he had made to St. Paul, Minnesota, about thirty years before, when that great and thriving city was hardly more than a village.

He met there Sir George Simpson, the head of the Hudson Bay Company, and there was at the time, in the neighborhood of the town, an encampment of half-breeds, about one hundred in number, who had come on their first visit from the Red River region, for the purpose of establishing relations with the Americans for the exchange of commodities. These people were tall and well made, vigorous, and intelligent, with the Indian type strongly impressed upon the features of the face, and the long, straight hair. They spoke no language but English, and this with a Scotch accent, even more decided than any Judge Daly remembered to have heard in Scotland. They were, in fact, the descendants of the colony planted by the Earl of Selkirk on the Red River in 1811, and their visit to St. Paul conveyed

to the Americans the first intimation of the then unknown wealth and resources of the great Red River country.

On motion of Judge Daly, the thanks of the Society were unanimously voted to Dr. Ellis for his interesting paper.

GEOGRAPHICAL NOTES.

When was Florida discovered ?

This question has recently been discussed by President Barnard, of Columbia College, and by others, and the shortest way of stating it seems to be to quote the account given by Herrera, dec. 1, lib. ix., cap. x. :

“Partieron de aqui corriendo por el Norueste, i Domingo à 27. que era Dia de Pascua de Resurreccion, que comunmente dicen de Flores, vieron vna Isla, i no la reconocieron : [Eleven lines describe the voyage up the coast to the 2d of April:] . . .

“Y pensando que esta Tierra era Isla, la llamaron la Florida, porque tenia mui linda vista de muchas, i frescas Arboledas, i era llana, i pareja: i porque tambien la descubrieron en tiempo de Pascua Florida se quiso Juan Ponce conformar en el nombre, con estas dos razones.”

“They set sail from here, running towards the North-west, and on Sunday, the 27th [of March, 1512,] which was Easter Day, commonly called of Flowers, they saw an island, and did not recognize it :— . . . And thinking that this land was an island, they called it Florida, because it offered a very pleasing landscape of many fresh groves, and was level and uniform, and also because they discovered it at the time of Easter, Juan Ponce wished, for these two reasons, to decide upon this name.”

Herrera was historiographer of the Indies, under

Philip II., and his immediate successors; he had access to all official documents, and he followed in his work, perhaps too strictly, the chronological order of events. His authority as to the date of the discovery of Florida should seem to be decisive. His work first appeared in 1601, and in 1605 Garcilasso de la Vega's "*Florida del Ynca*" was brought out at Lisbon.

In this work the discovery by Ponce de Leon is said to have been made on Easter Day, the 27th of March, 1513.

Murillo Velarde (Madrid, 1752) says: "*Esta tierra se llamaba Cantio* [Herrera writes this native name *Cautiô*], la descubrió Juan Ponce, Gobernador de Puerto Rico, á 2. de April de 1512, y la llamaron *Florida*, porque tenia buena vista, de muchas frescas arboledas, y por ser tiempo de Pasqua de Resurreccion."

"This land was called *Cantio*, and Juan Ponce, Governor of Porto Rico, discovered it on the 2d of April, (the day he landed), 1512, and they named it *Florida* because it was pleasing to the eye, with many fresh groves, and because that was the season of Easter."

President Barnard seems to think that Herrera is right as to the year of the discovery, but wrong as to its having occurred on Easter Day, since the 27th of March, 1512, was not Easter, and not even a Sunday; and he finds that the encyclopædias do not agree in rendering the sense of the Spanish term *Pascua Florida*.

As to this, the dictionary of the Spanish Academy is the authority.

The word *Pascua* is there defined:

"En la iglesia Católica la fiesta solemne de la Resurreccion del Señor. . . ."

"In the Catholic Church the solemn feast of the resurrection of the Lord. . . ."

"——Pascua de Flores ó Florida. La Pascua de Resurreccion——"

Herrera's understanding of the term agrees with this definition, and the contemporary translation of Peter Martyr, in Hakluyt, shows that, even among foreigners, there was no doubt as to the meaning of the name:

"They suppose this island to be that whereunto Johannes Pontius, the captain of one ship, went and left them much disquieted, being repulsed by the inhabitants, and called it Florida: because he found that Ilande on the day of the resurrection: the Spaniard calleth Easter, the flourishing day of the resurrection."

President Barnard has suggested that Herrera, transcribing the records before him, set down an erroneous date. This is far from impossible; but it is to be observed that three other dates, all wrong, follow the first one.

It is said that on Sunday, the 8th of May, Ponce de Leon doubled Cape Corrientes; that on Friday, May 13th, he set sail from Santa Marta; and that on Whitsunday, May 15th, he sailed among a group of isles to which he gave the name of "The Martyrs." Each one of these dates is directly related to the mistaken date of Easter; and that can be readily accounted for on the very natural assumption that an error found its way into Herrera's calculation. It is not easy to admit that Ponce de Leon himself made the mistake, for navigators of the sixteenth century could hardly be ignorant of the dates in the Church calendar. Navarrete, an accurate writer, supports Herrera. In the "*Viages y Descubrimientos*," vol.

3, p. 51, he says that Ponce de Leon "siguió al NO. hasta que, en el domingo de Pascua 27 avistó tierra . . ." —"continued to the northwest until, on Easter Sunday, the 27th, he sighted land."

Nevertheless, it is quite certain that the 27th of March was Easter Day in 1513, but not in 1512.

The calculation is easily made. Delambre gives the rule, adapted from Gauss, for finding the date of Easter in any Julian year:

- 1st. Divide the year by 19, and call the remainder a .
- 2d. Divide the year by 4, and call the remainder b .
- 3d. Divide the year by 7, and call the remainder c .
- 4th. Divide $(19a + M)$ by 30, and call the remainder d .
- 5th. Divide $(2b + 4c + 6d + N)$ by 7, and call the remainder e .

$$M = 15, N = 6.$$

Add the remainders of the 4th and 5th operations to the 22d March (the day after the equinox).

All the probabilities so far are in favor of 1513 as the year of the discovery, though the expression employed by Murillo Velarde makes it possible to suppose that Ponce de Leon was moved by the near approach of the festival (it fell on the 11th April) to give the name, which suited at once the time and the appearance of the land.

There exist, however, in the *Archivo de Indias* two documents to which some attention must be paid. The first is Ferdinand's "Capitulacion," giving Juan Ponce de Leon authority to discover and settle the island of Beniny. This paper allows three years for the discovery, and requires that the voyage should be undertaken within the first year. It is dated at Burgos, the 23d of Febru-

ary, 1512, and Ponce de Leon could not have received it when he set sail from San German, in Porto Rico, on the 3d of March of the same year. If his voyage was not made till 1513, the "Capitulacion" would have reached him in time.

The other document makes short work of the probabilities. It is a decree of Ferdinand's, and begins with these words:

"* El asiento que se tomó por Nuestro mandado con vos Juan Ponce de Leon, para ir á poblar á la Isla de Beniny é la Isla Florida que vos descubristes por Nuestro mandado, demas de la capitulacion y asiento que con vos se tomó, quando la ficistes á descubrir, es el siguiente: "

"The contract made by our command with you, Juan Ponce de Leon, to go and settle the island of Beniny and the island of Florida, which you discovered under orders from us, over and above the authority granted and the contract entered into with you when you prepared to make the discovery, is the following":

The decree then recites the powers and duties of Ponce de Leon, as ruler of the newly discovered islands, and it is dated at Valladolid, the 26th of September, 1512.

Ponce de Leon did not reach Porto Rico on his return voyage, according to Navarrete, until the 21st of September. How was it possible for Ferdinand, at Valladolid, to learn the successful result of the expedition and the name given to the newly found country within five days from the return of the discoverer?

* Coleccion de Documentos Inéditos relativos al Descubrimiento, Conquista y Organizacion de las antiguas Posesiones Españolas de América y Oceanía, sacados de los Archivos del Reino y muy especialmente del de Indias, competentemente autorizada, tomo xxii., p. 33, Madrid, 1874.

This was clearly not possible; but the date and the past tenses of Ferdinand's decree are uncompromising. They cannot be set aside, and they refuse to be changed.

There is one incident of the voyage along the coast of Florida which may, perhaps, have some relation to this matter. On the 21st of April the vessels, running with a free wind towards the south, encountered a current so strong that they went astern instead of making headway. Two of them hugged the shore and got through, but the third, a brig, being farther out to sea, was borne away by the force of the current, and disappeared. The day was bright. The other vessels took in wood and water farther down the coast at a stream called the Rio de la Cruz, and waited there for the brig; but she did not return, and the narrative does not mention her again.

The current encountered by these vessels was the Gulf Stream. What became of the brig when carried away by it? It is not to be believed that her captain lost control of his vessel.

He may have taken advantage of the great current, as Orellana did on the Amazon nearly thirty years later, to continue his voyage across the Atlantic to Spain, where he would have much to report; and if he did this, there would be no difficulty in accounting for the king's early acquaintance with the discovery of Florida.

This may or may not be the explanation of the mystery; but the main fact is settled, that the discovery took place in the year 1512, about the time of Easter, and possibly on the 27th of March, the date given by Herrera.

Some publications on the Sources of the Mississippi should be noticed.

Mr. Russell Hinman, in a letter to *Science*, of Aug. 13, 1886, examines Capt. Willard Glazier's claim to the discovery of the true source of the great river in a lake south of Itasca, in the year 1881. Mr. Hinman gives four maps: Schoolcraft's, of 1832, Nicollet's, of 1843, the U. S. Land-Office Map, of 1879, and Capt. Glazier's, of 1881; and an examination of these shows that the small lake, to which Capt. Glazier has attached his own name, was mapped by Schoolcraft in 1832, fully explored and mapped by Nicollet in 1836, and surveyed, mapped, and named "Elk Lake" by the Land Office prior to 1879.

Nicollet says, in his report (Senate Document, No. 237, 26th Congress, 2d Session, 1842): "The honor of having first explored the sources of the Mississippi and of introducing a knowledge of them into physical geography, belongs to Mr. Schoolcraft and Lieutenant Allen. I come only after these gentlemen; but I may be permitted to claim some merit for having completed what was wanting for a full geographical account of these sources. Moreover I am, I believe, the first traveller who has carried with him astronomical instruments, and put them to profitable account along the whole course of the Mississippi from its mouth to its sources."

Capt. Glazier places Glazier Lake in lat. $47^{\circ} 13' 25''$; and Mr. Hinman shows that this position is actually *within* Lake Itasca.

Glazier's account was published in vol. i., of the *American Meteorological Journal*, Detroit, 1884, and Mr. Hinman quotes from it three passages which have clearly been adapted, or conveyed almost bodily, from

Schoolcraft's book, published fifty years before ; and he finds that an addendum entitled "Meteorological observations at the head-waters of the Mississippi," given by Glazier on p. 328 of his account as original, is an exact copy, word for word and figure for figure, of observations taken, in the year 1820, by Schoolcraft, in the vicinity of Cass Lake (*Narrative*, 1855, p. 423).

This discovery should be even more interesting to Capt. Glazier than the one he claims.

Mr. Henry D. Harrower, in Ivison, Blakeman, Taylor, & Co.'s *Educational Reporter—Extra*, for October, 1886, follows up and elaborates the investigation begun by Mr. Hinman. He gives the following maps :

Capt. Glazier's map ; Lake Itasca from Capt. Glazier's large map ; Lake Itasca and Elk Lake, from surveys in the Land Office ; Lake Itasca, from Lieut. Allen's sketch ; Lake Itasca, from Nicollet's map in the Land Office ; Lake Itasca, from Nicollet's map in office of Chief of Engineers ; Sketch Map of Itasca Lake Region, by Julius Chambers ; Itasca Lake and Elk Lake, from surveys of Land Department ; Lake Itasca and Vicinity, from Stieler's Hand Atlas ; Sketch of the Sources of the Mississippi River, from Lieut. Allen's Observations.

Besides these maps, Mr. Harrower presents a number of extracts from Capt. Glazier's "Account," side by side with the original passages from which they have been adapted, or copied literally ; the last of all being the table of *Meteorological Observations*, which Mr. Hinman found to have been taken bodily from Schoolcraft.

Mr. Harrower states, at the end of his pamphlet, that Messrs. Ivison, Blakeman, Taylor, & Co., have sent an expedition to make a complete survey and delineation of

the region which supplies the chief feeders of Lake Itasca.

Both Mr. Hinman and Mr. Harrower have done thoroughly what they undertook to do, and there is but one person who can have any reason to be discontented with the result of their labors.

In the *Bollettino of the Società Geografica Italiana*, for June, 1886, Prof. Giuseppe Pennesi seeks to prove that the discovery of the sources of the Mississippi was made in 1823, by Beltrami; and he reproaches Schoolcraft with having failed to recognize the performance of his Italian competitor. What was that performance? It is not in the power of man to give a definite answer to this question. Beltrami's book, published in French, at New Orleans, in 1824, is written in the form of letters, diffuse and rhetorical in style and very fatiguing to the reader, who seeks, and seeks in vain, for something precise and positive. Schoolcraft's positions can be identified; Beltrami's are left in doubt.

What his qualifications were may be read in his confession: "I cannot give you the exact latitude and longitude of this interesting point, for I have none of the instruments needed for such an operation and, to speak frankly, I should perhaps be unable to use them in a satisfactory manner, even if I had them."

He believed undoubtedly that he had found the source of the Mississippi; and the legislature of Minnesota has recognized his services by giving his name to one of the counties of the State. Michigan has done as much, and no more, for Schoolcraft; and the two explorers stand, so far, on equal ground.

There is nothing to show that injustice has been done

to the Italian, but even if there were a sign of it, his champion should remember that injustice is sometimes unintentional. There is in his own paper a striking illustration of this truth. Beltrami tells us, on page 245 of his book, that he "seemed to see the shades of Columbus and Amerigo Vespucci and the Cabots and Verazani and others gladly taking part in this great ceremony, and congratulating themselves that one of their countrymen had come to revive, by new discoveries, the recollection of the services which they had rendered to the whole world by their talents, their exploits, and their virtues."

This passage Prof. Pennesi quotes, in a slightly condensed form, as the composition of Count Pietro Moroni, one of Beltrami's biographers. Is it too much to say that this looks like wounding the traveller in the house of his friends?

The number of States in the American Union is constantly increasing, but to add them before they are made is to let zeal outrun discretion.

Many geographical journals, English, French, German, Italian, and Brazilian, have reported and continue to report that Dakota and Washington Territories were admitted as States early in the year 1886. The facts in both cases were correctly given in *Petermanns Mittheilungen*, Band 32, Nr. vii., and ought to have been within the reach of all as long ago as last July.

There is no reason to doubt that the Territories named will become States in due course of time, but not in the year 1886.

Lake Tâhoe, long regarded as the deepest fresh-water lake in the United States, must now take the second place. Capt. C. E. Dutton, of the United States Geo-

logical Survey, made in July, 1886, a series of soundings in Crater Lake, Oregon, with unexpected results.

The mountain wall that surrounds the lake is nine hundred feet high, and very steep; and deep water is found everywhere at a distance of only three or four hundred yards from the shore. .

The average depth of the lake is not far from 1,500 feet, the minimum being 853 and the maximum 1,996 feet.

Capt. Dutton does not regard his exploration as final, and future soundings may reveal even greater depths.

Prof. John Le Conte, writing to *Science* on this subject, gives an interesting comparative table of certain well known fresh-water lakes of the world. According to this table, the American lakes stand, in the order of their depth, as follows: Crater Lake, 1,996 feet; Tahoe, 1,645; Superior, 1,010; Michigan, 864; Ontario, 738; Huron, 705; Temisconata (Canada), 500; and Erie, 324.

In Europe, Lago Maggiore is 2,612 feet deep; Como, 1,926; and Lake Lemman, 1,017.

The great Siberian lake Baikal, the last on the list, is said to have a depth of 12,356 feet. This, Prof. Le Conte thinks, is almost incredible; and the only authority for it seems to be a Bavarian journal, quoted in *Nature*, vol. xvii., p. 468. It is certain that the most complete examination of Lake Baikal yet made, that by the Polish savants Dibowski and Godliewski, shows no such measurement. These explorers planted their stations on the frozen surface of the lake in the winter of 1876, and took careful soundings. The greatest depth reached was 1,373 metres, or 4,504 feet.

The *Revue Géographique Internationale*, of Paris, for June, 1886, speaks of a project, seriously entertained by

the American Government, for building a railroad with three tracks between Colon-Aspinwall and the Pacific Ocean. An immense truck, drawn by six powerful locomotives, is to take up an ocean steamer at Colon, carry it across the Isthmus, and put it down in the Pacific. This brief description is made more intelligible to the reader by a full-page illustration of a first-class steamer making the transit, with the legend below :

“Projet de transbordement des paquebots à l’isthme de Panama.”

The plan, as described, curiously resembles Capt. Eads’s proposed railway across the Isthmus of *Tehuantepec*, and the illustration is unmistakably enlarged from the cut frequently seen in pamphlets on the subject of that enterprise.

The American Government does not seem to concern itself with the Panama Ship-Railway, and the *Revue* may have to wait a long time for further developments. The leisure thus gained might be turned to profitable account in a more or less detailed study of the Western Continent, with its seas, gulfs, isthmuses, and peninsulas.

The *Scottish Geographical Magazine*, which is doing so much and such excellent work, devotes some space in its October number to an account of the earthquake shocks of August 31st and the following days, in the United States. The chief centre of these shocks, we are told, appears to have been at Charleston, *North Carolina*, which was partially destroyed.

It should have been added that the fortunate situation of this well-known seaport, in the mountains near the Tennessee line, saved it from the tidal wave which so often follows an earthquake.

Lieut. Frederick Schwatka left Port Townsend, Washington Territory, in June, 1886, at the head of an expedition, fitted out by the proprietor of the *New York Times*, to explore the region around Mt. St. Elias. He has reported a number of discoveries. A large river, running with a swift current into Icy Bay, he named the Jones River, after Mr. George Jones, of New York City, the patron of the expedition. Lieut. Schwatka ascended the course of this river to where it emerged from a large lake, to which was given the name of Lake Caetani, in honor of the Duke of Sermoneta, President of the Italian Geographical Society; and he is of the opinion that the head-waters of the river are in the far interior of the country. He estimates that not less than four or five thousand square miles of this region are covered with glaciers, some of enormous extent. One on the eastern bank of the Jones River was named after Agassiz, and two on the western bank received, the first on the suggestion of Prof. Libbey, the scientist of the expedition, the name of the Guyot Glacier, and the other the name of the Tyndall Glacier.

The low land was found to be mostly swampy, with patches of dense underbrush and occasional forest tracts, in which the trees were of great size.

Beyond the forest, at the foot of Mt. St. Elias, there was within view a range of hills to which was given the name of the Chaix Hills, from Prof. Paul Chaix, President of the Geneva Geographical Society.

The cluster of mountains, which bears the general name of St. Elias, is described as a very striking mass. Three of these mountains were named after President Cleveland, Secretary Whitney, and Capt. Nicholls.

Lieut. Schwatka thinks it a misnomer to call these grand mountains the "Mt. St. Elias Alps," and suggests that they deserve to be known, like the Andes and the Himalayas, by a name of their own, collective at once and distinctive.

There is something in this suggestion, though the implied comparison with the mighty ranges named is not entirely in good taste. The question of geographical nomenclature is too broad to be treated in a paragraph, but it may be said that there seems to be too little regard paid by explorers to the existing native names of natural features.

Four of Lieut. Schwatka's party, including himself, made an attempt, at the end of July, to ascend Mt. St. Elias. They met with very many obstacles—crevasses, often thirty feet wide, ice cascades, and precipitous walls of snow and ice. After nearly five hours' toil they reached a point 5,800 feet above the sea. The whole mountain above this point was enveloped in fog, but two of the party pushed on 1,500 feet farther, and were there forced to turn back, the difficulties being insurmountable.

Lieut. Schwatka's full report will be extremely interesting.

Col. Wm. H. Gilder, well known as an Arctic traveller, started from New York, in the autumn of 1886, on a journey to the North Pole by land, with but one white companion, Lieut. Griffith. The plan is to get as far north as possible in a whaler and, after leaving the vessel, to head directly for the Pole over the ice and snow, with such help as can be had from the Eskimos, with whose habits and ways of life Col. Gilder is familiar. He was

fully provided with such supplies as he deemed indispensable, for it was his purpose to trust largely to the game resources of the desert region before him. When last heard from he was at Fort Churchill, on Hudson Bay, and was to remain there till the spring of 1887.

If any form of intellectual activity can be said to be misdirected, it is certainly that which wastes itself upon the creation of a new language, and this, not because there are already in existence too many forms of speech, but because, with all its quasi-scientific look, it wholly ignores facts, which alone give a basis to science.

Languages are not made by a deliberate, studied purpose; they grow, like the varied forms of life in the vegetable and animal worlds.

Two new languages are now attracting some attention, each invented, it is said, to facilitate commercial intercourse among men.

The first is known as Volapük, a name not altogether attractive to an English ear. This tongue, invented by Dr. Schleyer, of Constance, is regular throughout. The alphabet has twenty-seven letters—eight vowels and nineteen consonants. Every letter is pronounced, and always in the same way. There is, therefore, no diphthong, in the ordinary sense. The letter *l* is substituted for *r*, as a concession to the supposed Oriental (Chinese?) incapacity for the struggle with the latter. In every word the accent falls on the final syllable. There is one declension, with five cases; and the plural is made by the addition of the letter *s*. There is no article. Adjectives are invariable and always follow the noun. Used as substantives, they are declined as those are.

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The verb is made from the substantive by the addition of the syllable *ön*, and the tenses are formed by certain arbitrary prefixes. The passive is made throughout by prefixing the letter *p* to the active.

Since 1881 Volapük has been studied in Germany, Austria, Holland, Sweden, England, Spain, the United States, Syria, and other countries. A German-Volapük grammar, and a dictionary containing thirteen thousand words, have both reached a fifth edition, and in January, 1886, there were published three Volapük reviews, one each at Constance, Breslau, and Rotterdam.

The other new language is the work of M. E. Courtonne, of Rouen. It is called the Neo-Latin language, and is offered, as a means of communication among themselves, to the six nations more or less decidedly Latin—the French, Spanish, Italian, Portuguese, Rouman, and English.

The Neo-Latin, like Volapük, has but one sound for each letter, monosyllabic radicals, invariable prefixes, and certain suffixes; but it does away with the case-endings and maintains the article. Its verb is simplified, and the relation of its forms to their radicals is easily made out.

It is claimed for each of these tongues that it reduces the labor of learning to a minimum; but to learn any thing requires application and effort, and men are not easily persuaded to undergo the toil necessary for the acquisition of a real language, which has been developed and used by a great nation.

Experience shows that not even the most obvious self-interest, not even the pressing demands of commerce, or of empire, avail to enforce the study of a strange tongue so long as interpreters can be had.

How many of the foreign merchants in China are Chinese scholars? The English in India and the French in Algeria are still, for the most part, unable to converse with the native inhabitants.

Volapük and the Neo-Latin language have been put together with ingenuity, but their usefulness may be doubted.

The Prince of Monaco has told, in a pamphlet of forty pages, with illustrative plates, the story of his experiment to ascertain the course of the Gulf Stream.

He left Corvo, in the Azores, on the 25th of July, 1885, and on the 27th, when at a distance of 117 miles to the northwest of the island, began throwing out the floats he had provided.

These numbered in all 169, or 170, or 179, for the Prince's arithmetic is like a game of chance.

There were, in any case, ten copper globes and twenty kegs, and an unsettled number of bottles. More than a hundred floats were dropped, one at every mile made, and the rest, one at every subsequent half-mile.

Up to the 26th of January, 1886, eleven of these had been recovered, all within the Azores. The drift in every instance was towards the S. E., and was probably due to the combined action of the wind and local currents.

The other waifs are yet to be heard from, and the Gulf Stream may have carried them far towards the N. E., beyond the chance of rescue.

M. Venukoff, in the *Revue de Géographie* for August, 1886, calls attention to the rapid diminution of the lakes in Central Asia.

Lake Ast-kul, which appears on the map of the Caspian Sea, in 1859, as communicating with the sea by a strait deep enough for large vessels, had disappeared in 1873, and the Russian troops marched over what had been its basin.

On the northwestern side of the Aral Sea, the Gulf of Barsut, which was 40 miles long in 1741, was not in existence in 1846, and its bed is now a waste of moving sand.

Aibugir, a gulf on the southern side of the Sea of Aral, was, in 1859, about 70 miles long and from 10 to 18 miles wide. It was completely gone in 1874.

Lake Balkash, which is 340 miles long and 55 miles wide, is shrinking with great rapidity. Its level is lowered, according to M. Nicolsky, at the rate of 1 metre, or 39.37 inches, every fourteen or fifteen years. The southern part of its basin, known by the name of the Ala-kul, is being transformed into a bed of salt.

Comparing the accurate maps of 1820 and 1880, M. Venukoff finds that the four Siberian lakes, Tchany, Abushkan, Moloki, and Sumy, have lost in the sixty years 59 per cent. of their surface, or almost exactly 1 per cent. a year.

This state of things threatens ruin to a territory larger than Europe, and to meet the danger M. Venukoff recommends the reopening of the communication between the Caspian and the Black seas, and, as a preliminary operation, the turning of the river Don into the Volga. The distance between these two rivers, by the canal planned a number of years ago, by Gen. Melnikoff, is only 33 miles.

There is a certain pungency in M. Venukoff's remark,

that the whole of the great work he proposes could be carried out at a cost much below that of the wars of 1870 and 1877.

Captain Bedford Pim, R. N., died in London on the 30th of Sept., 1886, at the age of sixty years.

Capt. Pim was the son of an English naval officer, and began his own career in the service at sixteen. He was on the *Herald* in the voyage round the world in the years 1845-1851, and in 1852 joined Sir Edward Belcher's expedition to search for Sir John Franklin. On this expedition, in March, 1853, he crossed the ice alone, from the ship *Resolute*, which had entered the Arctic from Baffin's Bay, and met a party from Capt. Maclure's vessel, the *Investigator*, which had reached the Arctic through Behring Strait. In this way he found the N. W. passage.

Capt. Pim served in the Crimean War and in China, and, as commander of the *Gorgon*, in the West Indies and on the Central American coast. He became interested in the subject of interoceanic transit, and made explorations and surveys in Nicaragua, between the years 1859 and 1867. He was retired from the naval service in 1870, "compulsorily," as the *Proceedings* of the Royal Geographical Society gracefully put it, began immediately the study of the law, and was called to the bar in 1873.

He sat in Parliament, as member for Gravesend, from 1874 to 1880. His relations with the American Geographical Society and his interest in its work were of long standing, though it was not till 1885 that his name was entered on the roll of its corresponding members.

A man of untiring energy and activity, Capt. Pim impressed those who met him as a typical seaman, full of enterprise and daring and generous impulse.

Mr. R. N. Cust, a geographer and philologist worthy of all respect, seems to have but a poor opinion of the European man as a spiritual being. He says, in the *Proceedings* of the Royal Geographical Society for August, 1886, that in Djerba, the Lotos-eaters' island on the coast of Tunisia, "there is a population of 35,000 souls, and 360 Europeans."

The "Société de Sciences et de Géographie d'Haïti," was founded on the 2d of June, 1886, at Port-au-Prince, under the patronage of General Salomon.

The President of the Society is the Rev. Father Weik, and the Secretary the Marquis de Teano.

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

AMSTERDAM. — *Revue Coloniale Internationale*, May-August.

- * The Soudan—A New State in Central Africa—
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FLORIDA AND THE WEST INDIES.

BY

PROF. F. A. OBER.

As the subject of investigation, this evening, comprehends 20° of latitude, and calls for a review of nearly three centuries of history, I shall waste no time in prefatory observations, but shall at once respectfully invite your attention to a few remarks (first) upon Florida—the latest-formed, perhaps, of all our vast country, yet the earliest settled by Europeans; the home of the gloomy alligator and melancholy “Cracker,” the hotel-keeper’s paradise, and the consumptive’s sanitarium.

Florida! At its mention spring forth the most romantic episodes of American history and cluster about its charming appellation, and we should fail of performing our duty as investigators did we not give a passing glance to its history and to the men who made it famous.

Close voyager in the track of Columbus, at least a peer of the great admiral himself, was Ponce de Leon, one time governor of Porto Rico. Unlike hundreds of his companion conquistadores—who found but poverty and death where they had expected life and fortune,—De Leon acquired wealth and position, and grew old in the islands he had helped to conquer. Grew old!—too soon; that was his only grief. Such an enviable position was his, that he would fain have enjoyed it for ever; for he had gold from the sands of mountain streams, gardens

of tropical fruits, and captives by scores to minister to every want. From one of these, a Carib maiden, captured in an island south of his domain of Porto Rico, he heard, at last, of something that promised the blessed boon of rejuvenescence. For :

" There came to De Leon, the sailor,
An Indian maiden, who told
Of a country so bright, that the rivers
Were bedded with gems and with gold ;
And she added : ' The leafy Bimini—
An island of grottos and bowers—
Is there ; and a wonderful fountain
Upsprings from its garden of flowers.
That fountain gives life to the dying,
And youth to the aged restores ;
They flourish in beauty eternal
Who set but their foot on its shores.' "

And so, lured by the Carib girl's story, De Leon went in search of the "Fountain of Youth." Accepting the poet's version :

" He was wafted past islands of spices
As bright as the emerald seas,
Where all of the forests seemed singing,
So many the birds in the trees.
By day, his light canvas he shifted,
And sounded strange harbors and bars ;
By night, on the full tides he drifted
'Neath the low-hanging lamps of the stars,
Near the glimmering gates of the sunset ;
In the twilight, empurpled and dim."

Thus he approached the shores of the continent, on Palm Sunday (*Pascua Florida*), in the year 1512, ten years after Columbus first set foot—if he ever did—on the same continent, farther south, and but twenty after the first voyage of Spanish sailors across the Atlantic.

The events of that time, and the succeeding years of

conquest and exploration, are like the shiftty scenes in a sensational panorama; for those were the closing years of the age of chivalry, of the era of the Crusades.

And thoroughly of the spirit of the times was the great expedition that sailed for Florida a quarter of a century later—that of De Soto, Captain-General of Cuba, and Adelantado of all the Floridas. With eleven vessels, three hundred and fifty horses, and one thousand men, this hero of Peru (who had won his title and fortune by his unaided sword) landed on the west coast of Florida, in the month of May, 1539. Florida, at that time, was a name pregnant with vague and mysterious meaning; not, as now, applied to a narrow peninsula, but comprehending a vast territory, measureless, undefined, stretching from the Southern Gulf to the Frozen Ocean, and containing, perhaps,—to the inflamed imagination of these explorers,—cities of boundless wealth, and nations of opulence and power. Second in interest to no other expedition of the age, promised to be this of De Soto. Disappointed in his search for the shorter route to the East, Columbus had been ill content with the discovery of a few islands in place of the great continent; and now, this second Columbus was possessed with the idea that this, at last, was the Cipango—the country of diamonds and pearls, of perfumes and spices.

But you know the result of that great enterprise; begun in consummate splendor, ending in abject misery. You already know of the march of that armed host through the vast Floridian wilderness swarming with savages; of the advance of steel-clad cavaliers, with prancing steeds and flaunting banners, marching, for three years, through the forests of Florida, Georgia, and

Alabama. At last, but a pitiful remnant gathered about their stricken leader, dying, on the banks of the river he had discovered—the mighty Mississippi. He who “had traversed half the continent for gold, and found nothing so remarkable as his own burial-place.”

But let us step aside a moment from the march of history, and glance at the country De Leon, Narvaez, and De Soto were the means of adding to the Spanish crown. Its then unknown limits have since been defined and circumscribed; though even now, with its 1,500 miles of coast-line and 60,000 square miles of territory, it is not so very insignificant. It has spacious bays and sheltered harbors, great lakes, and mighty rivers,—like the St. John, which gives, with its tributaries, 1,000 miles of water-travel; it has immense forests of pine and oak, and broad expanses of swamp and prairie, through which, and over which, roam herds of deer, flocks of wild turkeys, and smaller game innumerable.

It has thousands of acres devoted to orange culture, islands covered with pineapples, plantations of bananas and sugar-cane, and groves of palmettos and magnolias; yet there is one other possession of Florida that excels in importance all these enumerated. Lying between the warm waters of the Gulf of Mexico and the wonderful Gulf Stream, the peninsula is covered with a warm aerial blanket, that rarely suffers frost to approach, and creates a bland and genial climate, favorable alike to fruits of the tropic, and to visitors from more northern climes. Yes, I repeat, Florida has a superlative blessing in its climate. And Florida *has* a soil. Many have denied this, but it is true; and it is variously characterized as low and high hummock, swamp, and pine barren. In

order of productiveness, the swamp ranks first, but in salubrity of surroundings the pine barren takes precedence. The hummock—so-called from the Indian word *hamak*—distinguishes land covered with deciduous trees, and is oftenest chosen for cultivation.

But above all, when selecting a place of residence, cleave to the rolling pine lands, with their lofty trees that distil an odor balsamic, and their smooth carpet of wire-grass and flowers. You may find them like extensive parks, where the great trees run straight up, without a limb, for 60 feet, and where you can see through the tree-trunks for miles.

The western and western-central portion of the State—as, for instance, that in which Tallahassee, the capital, is situated—is mainly a rolling country, diversified with lakes and streams. Twenty miles from Tallahassee is St. Marks, on the Gulf of Mexico, a place now gone to decay; and half way between, the wonderful spring of Wakulla, which bursts suddenly from a limestone cavern with a torrent of thousands of gallons.

The surface of this whole country covers a bed of limestone, which is hollowed into caverns and subterranean watercourses, through which rush great streams, which often burst into the open air, and after running a while above ground, disappear again. Sometimes the earth covering over some one of these caverns will suddenly sink out of sight, leaving a hole a hundred feet deep and wide, in which even great pine trees may be engulfed. These places are called "Sinks." In this region, even the bottoms of the wells drop out! A native was once digging a well here when, reaching the coral ledge, he struck it hard with his crow-bar and the bar disappeared,

followed by all the water in the well. The frightened Cracker ever after swore that the Devil himself had hold of the crow-bar, for he could feel him pulling at the other end !

Near the town of Gainesville is a great tract of submerged prairie, which was once dry land. This section commenced to sink several years ago, and—it is said—went under water so fast, that some cattle feeding there were drowned.

We have all, doubtless, heard of the man who saw a shower coming, whipped up his horses and kept ahead of it for three miles, catching the first drops on his tail-board, just as he drove into the barn !

They tell a better story of a similar character in Florida. A certain Floridian was out in the prairie "minding" cattle, one day, when he noticed the ground sinking—or the water rising—and moved a little way back ; still it gained on him, till he became alarmed, and switched up his horse. Well, that water pursued that man *for five miles*, and he just reached a knoll high enough for safety—the water at his heels—when his horse fell dead from fatigue !

To resume the thread of history which we have dropped in our wild pursuit of the Floridian :

The disaster that had overtaken the Spaniards did not deter them from pressing their conquests and following in the paths opened by their explorers ; for, though men of blood, bigoted and cruel, they were brave and persevering. In 1562 the French Protestants attempted a settlement near the mouth of the St. John's, but were massacred by the Spanish monster, Menendez, who founded the city of St. Augustine in 1565. The period

of Spanish occupation for the next two hundred years is almost a blank, broken only by the cession of Florida to the English in 1763, in exchange for Cuba, which they had captured. Twenty years later it was retroceded to Spain. In 1812 a war broke out with the United States, which ultimately resulted in this territory coming—in 1821—under the protecting wing of the American Eagle.

In 1835 the aggressive Southrons, now flocking into this region, became convinced that the valuable land owned by the Indians ought to belong to them. The poor Indian could show no better title than a possessory one, extending back three centuries or so, and consequently he was removed, at a cost to our government of seven years' obstinate fighting, many lives, and a vast deal of treasure.

In 1845 Florida was admitted as a State; in 1861 she passed the ordinance of secession; in 1865 begged leave to reconsider this vote and be allowed to return to the fold; since which period her history has been that of uninterrupted progress and prosperity.

With this brief presentation of Florida's salient features—historic and geographical,—let us glance at the picturesque features of the country.

Imagine yourselves coasting, first, the low-lying sea-islands of the Georgia shore, the southernmost of which is Cumberland—once the home of General Greene,—the one next south of it being Amelia, the northernmost of Florida. Here lies the old town of Fernandina, on the extreme northern tip of the Florida coast, with a fine, spacious harbor, a superb stretch of ocean beach, and direct rail communication with the gulf. Hardly any accessible watering-place on the southern coast has such

a beautiful beach and ocean-drive as this twenty-mile stretch of Fernandina, with its smooth sand, hard as a marble floor, its bordering beach-hummocks of live-oak and magnolia.

Everywhere along the coast grow the fibrous plants of the yucca and agave family, conspicuously represented by the Spanish bayonet (*yucca gloriosa*) with its sharp, needle-pointed leaves and (in summer) pyramidal masses of snow-white, bell-shaped flowers, fragrant as the famous frangipani.

Our journey through the State ought to begin, perhaps, with the St. John's, with its thousand-mile waterway (main and tributary). At its mouth it is quite wide; and at its very beginning—or ending, for it flows north—we find the palmetto rising from its banks. A light-house guards its entrance and flashes its beams over the foaming waters of a dangerous bar.

No trace remains of the earliest French settlements of 1562, and there is little to engage the attention of the observer until Jacksonville is reached, twenty-eight miles distant from the sea. As a city of remarkable growth, and as a starting-point for the most attractive portion of the peninsula, Jacksonville has claims upon the attention of every visitor. It has direct steam and rail communication with every settlement of importance upon the St. John's, on either coast, and with the interior. Being so centrally and commandingly situated, having the trade of the St. John's, with its countless tributaries and lakes, it is the place of all places in which to obtain a first glimpse of Florida in its most flourishing condition.

Its climate is not all that could be desired, for it is subject to extremes of temperature, and in winter will

chill a sensitive invalid to the bones with its nocturnal frosts. But it has much that is delightful, in its warm, bright days, and possesses a grand birthright in the St. John's alone.

From a small, insignificant town at the close of the Rebellion, it has since grown to be the most active, flourishing city in the South, wholly through Northern capital and immigration. It has now a population of some fifteen or twenty thousand, a vast variety of stores, numerous saw and lumber mills, and vast hotels and boarding-houses.

In itself, Jacksonville—save for a few broad streets shaded by water-oaks—is not very attractive; and a view almost anywhere necessarily includes one or more of its great hotels. More attractive are some of the suburban views and little towns farther up the river. There we find avenues of myrtles—the crape myrtle, that diffuses upon the wintry atmosphere the delightful perfume of its blossoms. Like every other tree or shrub in Florida, living or dead, it is hung with funereal flakes of Spanish moss.

Here one can take steamer for points even 400 miles distant; the larger craft commodious and even palatial, the smaller mere tubs—rafts for boats, and a stern-wheel to push them with.

A little settlement, 15 miles from Jacksonville, is Mandarin, the winter home of Mrs. Stowe, and some miles further up is Hibernia, with water-vistas opening out from its groved moss-draped trees.

One of the most flourishing places on the river is Green-Cove Springs, celebrated for its sulphur springs, which discharge at the rate of 3,000 gallons per minute.

Beyond again is Tocoï, 50 miles from Jacksonville, where an ancient railroad offers connection with St. Augustine, on the coast. A nearer road has proved a successful rival, giving a direct route from Jacksonville to St. Augustine; but the one by Tocoï was, in former years, the only line. A man in a hurry never took this road—but walked; for, it was related, the engineer drew water for the boiler from the mud-holes as he went along, the fireman cut the “light-wood” for the fire, and the conductor walked ahead to scare the cattle off the track and spank the babies found playing between the rails. His was an arduous labor, for he had sometimes to wait several hours for the train to overtake him.

The oldest European settlement in Florida, the ancient city of St. Augustine, founded by the murderer, Menendez, in 1565, has yet survived the perils and sieges of many wars, and stands to-day as a monument to the indomitable Spaniards of the sixteenth century.

Its cathedral is probably its oldest building; and, with its quaint architecture, its towers containing several bells, and its lavishly-decorated altar-piece, it is a shrine towards which travel, annually, many thousand tourists.

But an object of more absorbing interest is the Castle of San Marcos, now known as Fort Marion—the Morro Castle of Florida. When that royal freebooter, Sir Francis Drake, sailed northward from the plundering of Cartagena and the Spanish Main, in 1586, he espied on the Florida shore a tower and also a fort defending a town. To the worthy admiral's great joy, his soldiers found a chest of silver (£2,000), which he promptly appropriated and then sailed serenely on his virtuous voyage. Eighty years later another buccaneer, Captain

John Davis, plundered ill-fated St. Augustine, and in 1702 the town was sacked, though the fort could not be taken. Secure in their stronghold, the Spaniards laughed at the invaders; for that fort was, in those days, impregnable, built upon the most approved plans of the military science of the day.

With its arched gateways, its moats, battlements, demi-lunes, and ornate sentry-boxes, old Fort San Marcos is the grandest relic of three centuries ago to be found in this country. Compare it with the photograph of a castle in Cadiz, and admit that it must have been fashioned by a hand not unused to planning and building castles in Spain. There are dungeons and chambers in it in which have been confined many illustrious captives, white and red; as the fierce Osceola, and the scarcely less famous Coacoochee,—the Wild Cat of the Seminoles.

This fort and all the houses of St. Augustine were constructed of that remarkable shell-conglomerate known as coquina. In the construction of the fort the walls were cemented by the blood of hundreds of Indians employed in the task for sixty years. This coquina is quarried (from the beds where it was deposited, ages since, by the eddies of the Gulf Stream) by means of axes and saws, and being easily worked, forms the best and cheapest of building material, acquiring by exposure the hardness of iron itself.

Originally a walled city, there yet remains the gateway, through which the inhabitants once marched out to attack the Indians, and in which hung ponderous gates.

A quainter, more picturesque town than this Spanish relic of antiquity does not exist within the limits of our republic. Some of its streets are yet very narrow and

enclosed between high walls, over which hang perfumed vines and orange-trees, and jutting balconies, whose owners may almost shake hands across the rift in the limestone rock.

It is, however, fast losing its antiquity through the advent of the enterprising Yankee—as the Northman is called,—who has built himself substantial houses among the fig and mulberry groves.

In threading these streets and gazing upon these coquina walls, we are carried back to the time when Moor and Spaniard met in strife upon the plains of sunny Spain; for in the older structures we can see traces of the architecture of both.

Recent builders and architects have wisely returned to this effective Hispano-Moriscan architecture, and the largest hotel in the South, the new “Ponce de Leon,” erected here, a superb and costly structure, 350 by 450 feet, is after the purely Oriental types of Spain. The neutral-tinted and easily wrought coquina lends itself readily to the highest conception of sculptor and builder, and the grandest ideas are here to be found embodied in this palatial caravansary.

A remnant of a strange people lives here; the Minorcans, whose ancestors came from the Mediterranean isles a century and more ago. It is they who make the fanciful flowers from feathers of curlew and egret, fans and baskets of palmetto, and the bouquets of sea-oats and pampas grass.

With St. Augustine, we leave behind us the last reminder of Spanish occupation, and turn again to the banks of the anomalous St. John's. The most important place above Jacksonville is Palatka, recently connected

by rail with the central system of railroads, and possessing many fine hotels and pleasant orange groves adjacent.

The St. John's, as I have said, is merely a long chain of lakes, the largest of which—Lake George—lies about 175 miles up. At the southern side of this lake the river draws its banks quite near together, and the steamers glide between masses of palmetto and cypress, laurel and bay, hung with trailing vines in sheets of bloom; the stream and lateral bayous are covered with floating islands of water-lettuce, across which stalk snowy herons and daintily stepping egrets, while the mysterious snake bird sits in the gloom above the dark water, and, at the approach of the boat, disappears from sight.

Comfortable navigation ends on Lake Monroe, some 200 miles from Jacksonville, where one leaves the steamer to penetrate the great orange belt of Florida. But you can take smaller craft yet a hundred or two miles farther—to Salt Lake, and even to Lake Washington. I myself penetrated beyond this lake when on my way to the Kissimmee River and Lake Okeechobee, and reached a point where I could easily leap across the river.

Most wonderful and strangely fascinating of all Florida rivers, is the Ocklawaha—Hulkwa-wewa, in Seminole,—which flows for a hundred miles through a sombre cypress swamp. Across any part of it one can throw a stone, and in one place it is so narrow that the steamers (so called) passing through have but a foot to spare on either side.

This river has its rise in the famous Silver Spring; perhaps the veritable fountain sought by De Leon. It bursts out of a cavern with a stream navigable from the outset; so deep that the steamer takes you to its very

source ; so clear, that you can follow with the eye the smallest silver coin, as it descends to the limestone ledges, 60 feet beneath the surface.

I one day floated down the weird Ocklawaha, starting from this fountain-head, in a small dug-out. The changes in color of the limpid stream known as "Silver Springs Run" were infinite, from silver-white to deepest green ; and successive caverns, over 50 feet deep, threw out added torrents to the stream, until we reached the gloomy Ocklawaha, and floated through a swamp so dense that the sun scarcely reached us through the canopy of leaves and moss.

" Over our heads the towering, tenebrous boughs of the cypress
Met in a dusky arch, and trailing mosses in mid-air
Waved like banners that hang on the walls of ancient cathedrals."

Hitherto we have been in pursuit of information pure and simple ; I now claim the privilege of a relaxation, and ask you to paddle off with me to the hunter's fairy-land, to the elysium of reminiscences.

Let us go camping out. You know how it is in camping out ; a man divests himself of every artificial surrounding that makes life enjoyable and then sets out to enjoy it.

Indian river, a vast salt-water lagoon, is the paradise of the camper-out. The eddies of the Gulf Stream, in ages past, have thrown upon Florida's eastern shore such an accumulation of broken shells and coquina that the mouths of the Southern rivers have been closed, and their waters thrown back on the country, uniting laterally and forming extensive lagoons.

Indian River, 120 miles in length, connects with another system, the Mosquito Lagoon and Matanzas, giving

altogether over 300 miles of protected water travel within the sound of the surf beat of the ocean.

All the game of Florida, bear, deer, turkeys, panthers, were once here in the greatest abundance. In the swamps along its borders were vast heronries, where, gathered by hundreds, were beautiful egrets and snowy herons with downy, filamentous plumes. Pelicans breed here by thousands, oysters are abundant, and on the sea-beach, in June, scarcely a night passes that we cannot turn over an immense turtle, or find a turtle's nest containing half a hundred eggs. In this lagoon also is captured the bulky sea-cow, or manatee, sometimes 8 feet in length, and weighing 500 or 600 pounds.

Far down in the everglades, in the little-known interior of Florida, surrounded by impenetrable swamps and gloomy forest, lies the mysterious lake of the South, the vast Okeechobee. At the commencement of the present century this lake was as little known as in the time of De Soto ; and even 50 years ago, at the beginning of the Seminole war, every thing about it partook of the vagueness, and was tinged with the romance, that such an unexplored region, surrounded by Indians alleged to be hostile, was likely to create. Such it was even in 1874, when I organized my expedition to explore it. We were a month absent on this exploration, and my boat was the first to float upon its waters in nearly 30 years. We succeeded in dispelling the halo of exaggeration that surrounded the lake, and gave to the world a truthful account of its resources.

No creek or river formed the outlet of this vast body of water ; the accumulated drainage of thousands of square miles of territory slowly percolated through the

everglades by countless channels. Since my visit to Okeechobee, a company of capitalists has effected its partial drainage and added a vast area of cultivable land to Florida's territory. The only sections not in swamp or under water were covered with huge "India-rubber" trees, delicately foliaged box, and sweet-scented bay, their trunks covered with gorgeous epiphytes with flaming blossoms, and their branches, draped in Spanish moss, the roosting-place of vultures and turkey-buzzards.

In the southern portion of the peninsula—around Lake Okeechobee and near the northern keys—reside the few Seminoles left in Florida by the treaty of 1842—between two and three hundred only in number; and here they lead a peaceful life, cultivating their fields, and hunting.

It was while among the Seminoles, in 1872 and 1874, that I enjoyed my best sport hunting the alligator. All are, of course, sufficiently familiar with this saurian not to need a further description from me. By thousands and thousands the guileless alligator of tender years has been ruthlessly torn from the maternal breast and sent adrift upon the frozen North; hence, the alligator in a menagerie is as familiar as the ubiquitous monkey.

Even to-day, after having been the sport of tourists for years, they may be shot on the St. John's; though the best hunting is to be found in secluded creeks and bayous.

Though the alligator attains sometimes a length of 12 or 14 feet, he is more commonly found at 8 or 10. His jaw is always one fourth his entire length, and one 12 feet long displays an open countenance a yard wide. The teeth work up well into ivory ornaments, and the skin, when properly tanned, makes the most durable of leather. Some hunting boots I had made from a pair of nine-

footers lasted me five years' wear and tear by flood and field. The alligator's vulnerable spots are the eye, ear and just abaft the fore-leg. The rifle is the best weapon, but I have shot several dozen with a shot-gun and some even with a small revolver.

The alligator is daintily-choice in his food, preferring a dog to the piney-woods hog, and a juicy, well-developed negro to either. The bull alligators have a tremendous roar, which shakes the forest when they indulge in a concert. I once found them so numerous, in the Indian country, that we gave over shooting and took to harpooning them; a certain hunt by moonlight lingers in memory yet through a dozen intervening years.

One hundred years ago, when that quaint old philosopher and botanist, Bartram, sailed up the St. John's in his Indian canoe, the river was without a settlement its entire length, and the worthy man was frightened nearly out of his wits by the enormous alligators, which bit pieces out of his boat and nearly succeeded in devouring him.

The scenery of Florida, with its vast expanse of morass and pine barren, is in the main monotonous and dreary. But there is now and then a bit of landscape redolent of the breath of the tropics. Everywhere, draping the oaks and cypresses especially, is seen the Spanish moss (*Tillandsia usneoides*), which softens the harshest outlines and clothes the forests in a garment of delicate gray.

In the swamps, and particularly the hummock lands, rises the glorious magnolia, with its waxen leaves and crown of stars. Its flowers of creamy white dispel a fragrance that betrays its presence, even in the densest wood.

It is well known that nearly all the fruits and grains of the temperate zone, as well as those of the torrid, flourish here, and Florida supplies vegetables for the Northern markets in advance of every other source, except Bermuda, the production of which is limited.

One may plant *every month* in the year; potatoes of January may be dug in June, and strawberries ripen from December till May.

Below the frost-line are found all the semi-tropical fruits of the Mediterranean—oranges, lemons, limes, and guavas—and on the keys, the date and cocoa palm. But the grand productions of Florida are of the *citrus* family, which, introduced by the earliest Spanish settlers, is as good as indigenous, and is met with in a wild state everywhere—in the forest hummocks and near the lakes and rivers.

It will produce remunerative crops, from the seed, in from 7 to 10 years, and from the “stump”—a sweet shoot budded into a sour stalk—in from 3 to 5. It may be found anywhere in the State, but above the frost-line—say in latitude 28° or 29° north—a black frost is apt to come, once in a decade or so of years, and nip every thing off short in a single night.

The Florida orange is superior to nearly every other, and always commands the best prices. The yield of a full-grown tree varies from 1 to 5,000. A true Floridian, loyal to his native soil, and *with some of that soil to sell*, always places it at about 10,000 (!), not an orange less!

Another product of the Sun-land of our sister continent of South America is the pineapple, which is successfully grown on the Florida keys, though it requires such a

warm climate that it will never be a favorite article of cultivation with men of Northern race.

The golden harvest of Florida will be from the orange, supplemented by early vegetables and the fruits of the tropics. But the banana will doubtless prove the most profitable; as indeed it is the most beautiful of plants. Accepting the statement of Humboldt, it will produce more food to the acre than any other plant known, as the area necessary to produce 1,000 pounds of potatoes will yield 44,000 pounds if devoted to bananas. A plantation of bananas may be timed to bear the entire year round, as new shoots spring perennially from the base of the old stalk, which, like the century-plant, flowers but once, and then withers and dies.

Even if the banana produced nothing but its magnificent leaves (sometimes 10 feet in length and 2 in breadth), it would be a worthy object of cultivation, as it gives such a tropical aspect to an otherwise characterless scenery.

It is rarely seen here in its perfection, the winds so lash it, and tear the silken texture of its leaves into ragged ribbons. But I have seen it, in secluded valleys of the West Indian mountains, in its perfect loveliness, with its great purple buds and waxen blossoms, about which hover gilt-crested humming-birds and golden butterflies. Then it has seemed to me the very type of tropical luxuriance and beauty.

We will now leave these semi-tropics—these wonderful rivers, where live oaks swathed in moss overhang the banks, where palmettos thrust their crowns above masses of vines, where the golden apples of the Orient gleam and glow, where the alligator basks upon the shore, and where ibis and parrot fly o'erhead in clanging crowds, and seek

the margin of the Caribbean Sea, where cluster those isles of calm of tropic border-land.

South from Florida, direct, lies Cuba, the "Queen of the Antilles," recently brought a day, at least, nearer the cities of the North by the new Plant line via Florida.

I shall invite your attention to Cuba, only as a halting-place, a stepping-stone, in the journey to other isles beyond.

It has every requisite in steam connection with the United States; the well-known Ward, and the magnificent steamers of the Alexander, line giving quick and comfortable conveyance from New York to Havana; while by line of coast steamers access to the cities of the southern coast is obtained.

I would fain linger in Havana, that city so long in possession of the Spaniards, so fortunate in its geographical location, so unfortunate in its periodic visitations of the vomito, so picturesque in its approaches, guarded by Morro Castle, so disappointing to the explorer. Who that has threaded the narrow streets of the olden portion of the city, does not recall with a shudder the still narrower escapes he has had from passing carriage and donkey cart?

And who can forget the evenings in the Parque Isabel; the music, the promenades, the cool and liquid refreshments?

And the old cathedral, containing (perhaps) the ashes of the discoverer of this New World of ours; of itself alone it is worthy a visit to this emerald island.

The vast assemblage of islands lying between the two Americas, and known as the West Indies, is divided into three distinct groups: the Bahamas, lying nearest to

Florida; the Greater Antilles, comprising Cuba, Jamaica, Hayti, and Porto Rico; and the Lesser Antilles, or Caribbees. I will now ask you to voyage with me to these last.

Though lesser links in the great chain separating the calm Caribbean from the stormy Atlantic, these Caribbee isles are not the least interesting of the West Indies. Differing in structure from the coralline Bahamas and the primitive Antilles, these are volcanic; each island like a huge rock thrust up from the ocean-depths. While the more elevated peaks of the Greater Antilles exceed a height of 8,000 feet, but few of those in the Caribbees attain to 5,000; though their sudden uprising from the sea gives them the effect of a greater altitude.

Situated within the tropics, these islands feel the heat of the sun in all its strength; and yet the *climatic intensity*, due to their geographical position, is greatly modified, both by their insular position and by the air currents, especially the trade-winds.

After that memorable first voyage across the Atlantic, after the first landing in the Bahamas, and the first projected settlement in Hayti, Columbus returned to Spain, and then organized another expedition, to sail farther south, in quest of the abodes of the Caribs, or Cannibals. In November, 1493, he first sighted land, on this second voyage; either the island of Dominica, or Guadeloupe.

The first voyage (we well know) resulted in San Salvador, Cuba, and Hayti; the second in Dominica, Guadeloupe, the Virgin Islands, Porto Rico, and Jamaica; the third, in 1498, revealed Trinidad, the Gulf of Paria, the coast of Cumaná, Tobago, and Grenada; the fourth and last (1502) gave Martinique, the Honduras coast, Nicara-

gua, Panama, and Darien. On this voyage Columbus, first set foot on the North American continent.

This archipelago—this crescentic chain of the Caribbees,—containing the most beautiful islands in the western hemisphere, with a history inseparably connected with that of our own country, with settlements antedating Jamestown and Plymouth, with structure and physical features interesting to men of science the world over, yet remained for nearly four centuries an unknown field to the naturalist. And it was to penetrate these forests, and bring to light their hidden ornithological treasures, that I was commissioned by the Smithsonian Institute, in 1876, to explore them. I will only remark here that I succeeded in finding twenty-two species of birds, until then unknown, and in bringing to light many new facts bearing upon the distribution of animal life in those islands.

We find here (as in Mexico) three different and well-defined zones of vegetation: that of the coast, that of the higher hills and mountains, and that of the mountain-tops.

Approach one of these islands from the west—the Caribbean side,—that of Dominica, for instance, half way down the chain, in latitude 15°. In the distance a mountain towers, cool and misty; a pebbly beach stretches between high bluffs, with a grove of cocoa palms half concealing a village of rude cabins. Though the interior is one vast forest, covering hills and mountains so rugged that no clearings are made in them other than the garden patches of the Indians, there is along the coast a belt of fertile land several miles in breadth.

The villages are built in this little belt, and here are

those vast plantations devoted to the raising of sugar-cane, with their immense stone buildings, in which the cane is crushed, and the juice converted into sugar, molasses, and rum.

The air is sweet (in the harvest season) with the odor of cane; the laborers are fat and glistening from the eating of cane; the mules and cattle sleek—despite their labor—from the devouring of cane-tops; and the ebony youngsters, that run about in a state of corpulency and nature unadorned, fearful to behold, are brought up on cane and sugar.

The season comprising the first three months of the year may be called spring, or winter; it partakes of the characteristics of both; it is the opening of the period of inflorescence, and it is, likewise, the coolest season of the year. The regularity with which the elements perform their allotted tasks is a matter of surprise to a visitor from, let us say Boston, where there is no *present time* at all, in weather.

Even a *hurricane* forms no exception to the rule; it always comes on schedule time, and is never unexpected. People barricade their houses at the approach of a hurricane, crawl into a hole or cellar, with a prayer-book and a barometer, and wait for the roof to come off! Then they emerge from their retreats, send for the doctor, undertaker, and carpenter, and go on serenely with their interrupted business.

It is in this coast section, between the sea and the base-line of mountains, that the most noted tropical fruits are grown. In every garden are oranges, limes, lemons, bananas, plantains, mangos, zapotillos, avocado pears, citrons, guavas, and pineapples. Higher up the hills grows the

cacao (*theobroma cacao*) in dense groves, bearing its queerest pods of pulp and seeds.

Often you will see many trees having birth in far-off lands—as the sago palm, nutmeg, cinnamon; the bread-fruit (from the South Seas), and above them the cocoa palm—a native of Ceylon, though early introduced to these shores—spreads its frond of feathery glistening leaves. The cocoa palm is ever found growing by the sea, loving salt water and salt sea breezes more than the perfumed gales from out the mountain valleys.

Other palms replace it in the mountains, where they revel in shade and cool breezes; but this palm, as if ever conscious of the restless waves that bore its parent nut to these shores, delights to keep them company.

All the palms are beautiful, with their appearance of combined strength and grace and elasticity. No matter which species I look upon, I am tempted to exclaim: *This is the most beautiful!* There is nothing, however, to surpass in stateliness and superlative height the glorious *palmiste* (*oreodoxa oleracea*), which lifts its golden frond of exquisitely sculptured leaves one hundred and fifty feet above the vegetation at its base.

Growing along the coast, ever encroaching upon the domain of the sea, the mangrove rears itself upon long, spider-like legs; and near the streams are great tufts of bamboo, with lance-like shafts and quivering leaves. When these bamboos are attacked by fire, they explode with a noise like cannon, from the expansion of the steam generated from the water in their cells.

Every island has an abundance of insect pests, such as ants, centipedes, scorpions, jiggers, ticks, and tarantulas; sometimes so numerous as to be a cause of great anxiety.

Everywhere along the coast, and basking in sunny cliffs, we meet with the active lizard. The lizard is always harmless, in whatever country we find it; and often helpful to man by catching flies and other insects.

Equally innocuous is the iguana, a dweller in every portion of the islands, but especially abundant amongst the cliffs. Though so ferocious of aspect, it is, in reality, mild and harmless. Its flesh, being tender and white, is very acceptable in the West Indian *cuisine*.

In but few islands are there many snakes, or serpents, and in only two, Martinique and St. Lucia, do we find any species regarded as venomous. Yet in those two islands alone occurs the terrible *Fer-de-Lance* (*Cuspidophthalmus lanceolatus*), the lance-head snake, the bite of which is nearly always fatal. The diseases peculiar to tropical climates, such as endemic fever, cholera, and yellow fever, manifest themselves in greatest strength near the coast.

But it is not healthful to linger along the coast; the upper regions are cooler, and more salubrious.

Within the line of mountains is a cordon of hills, half encircling the towns. These hills are seamed and furrowed and scarred, yet are covered with a luxuriant vegetation of every shade of green; with the purple of the mango and cacao, and the golden hues of cane and lime, orange and citron.

Taking the mountain trail, beyond these hill-surrounded valleys, we finally reach a roaring river, and glancing up and along its bed, over masses of wild plantains and ferns, we see in the distance (a mile away, perhaps) a sheet of water dropping over the face of a cliff 200 feet in height.

We go up and on, until the forest belt is reached, and the path (ever ascending) widens through and among the vine-hung copses of the cool and refreshing higher woods. We have now reached the second zone of vegetation, lying between 500 and 2,500 feet above sea-level, and containing the greatest variety of tropical forms, and the most luxuriant vegetation.

In such forests as this, in various islands, I passed nearly two years, seeking out the new and rare forms of animal life therein contained. It was in a small clearing from the surrounding wilderness, where a few families of mountaineers lived peacefully, remote from the world, that I secured a small hut, in the immediate vicinity of a lonely cemetery, and began my camp life in the tropics, nine years ago. The happiest man in the mountains was my colored friend, Jean Baptiste, who was very proud to have in his sole charge, the only white man who had ever lived in his little hamlet. Through these tropical forests he guided me unerringly, hunting with me the wild hog and agouti, and catching for me the iguanas and the great serpents, that had their lairs in the gloomy chasms.

Many a day, has he left his labor in his little garden, to procure for me some new bird; and many a night (when darkness came and found us far from our cabins) has he deftly constructed a little shelter of palm leaves—an *ajoupa*—beneath the great trees covering the sides of the volcano.

Alas! poor Jean Baptiste! When he kissed my hand, at parting, six years ago, it was for the last time; as he was soon after scalded to death in the waters of the boiling lake.

Many a blessing, I dare say, poor Jean got from his dusky wife, old Madame Jo', for going off hunting with the stranger, when he should have stayed at home, cultivating his yams and plantains. Madame Jo', however, took sweet revenge on me—for she was my cook! She always carried with her a long, rank, and malodorous cigar; and the time when she enjoyed it the most and smoked it fastest—and distributed its ashes with greatest impartiality—was when she was cooking! But she had many difficulties to encounter; for her kitchen was open to the inspection of every hog and dog that ranged the clearing. Summer and winter—or rather, rainy season and dry season—she performed her culinary duties beneath this palm-thatched structure. And—she had always to make the fire in the morning!

In this interior wilderness of Dominica was situated a large lake of boiling water, the last vestige, it was thought, of volcanic activity in the island. Its waters were in a state of constant ebullition until January, 1880, when the entire region was devastated by an explosion, that left not even a trace of the luxuriant vegetation that surrounded it at the time of my first visit, nine years ago. I was the first American to visit this boiling lake, and my photographs were the only ones ever taken of it.

On our way to the lake, we wandered through a region of wonderful beauty—as to its vegetable forms; beneath the shade of palms and arborescent ferns, where the light that filtered through the filmy leaves was wonderfully lambent and golden. Musical cascades and waterfalls everywhere flashed and murmured. At noon, we halted and lunched, and took a bath in the hunter's stream.

All these islands are volcanic ; the latest eruption occurred in the island of St. Vincent (in lat. 13°) in the year 1812, when the entire island and the sea for eighty miles away were covered with volcanic ashes. The lava stream, at that time, reached the sea by a tortuous course, which is now known as the Dry River.

On our way back we met some Indian girls hunting crayfish in the mountain streams. The mountain crayfish are the most delicious in the world, and vie in delicacy of flesh with the mountain crabs, which annually perform a pilgrimage to the coast. The crayfish hunters, as they appeared outlined against a background of tropical leaves, with gleams of light and depths of shadow, formed a picture which I was tempted at once to photograph.

In this island of Dominica, and also in St. Vincent, there yet remains a vestige of that warlike race of Indians—the Carib. Columbus discovered them, and they were declared to be cannibals. Certainly, they always made a feast in honor of the capture of a Spaniard, and served him up tenderly, basted with care.

The dwellings of these people are embowered in palm and plantain groves, bread-fruit and calabash, which furnish them with fruit, as well as with perpetual shade. Here they dwell in happiness, weaving baskets, cultivating gardens, and building canoes from the great gum trees of the mountains. Their huts they build of reeds, sometimes without the aid of a single nail, or even rope, tying them in bundles, and lashing them to frameworks of poles.

I have, thus far, confined my narration to the incidents of life in a single island, and it will be seen that one evening cannot include every island in the chain scattered

over ten degrees of latitude. A few, however, stand out conspicuous, such as Martinique, Barbadoes, and Trinidad. The Garden of Plants of Martinique is a perfect bower of delight, for here are concentrated all the vegetable wonders of the Spice Islands; and all the palms, especially prominent being the famous "traveller's tree" (*l'arbre du voyageur*) introduced from Madagascar. This holds at the base of its beautiful leaves a supply of water for the thirsty, and spreads a fan such as might have been used by the gods of mythology.

But Martinique's chief claim upon the traveller's attention lies in the fact that it is the birthplace of an empress; for here, June 23, 1763, was born the lovely Josephine. In the central square of Fort-de-France—the Savane—surrounded by a circle of palmistes, and a double row of mangos and tamarinds, is a fine statue of the empress.

Five miles distant from this prosperous seaport—the capital of the island—is the little hamlet of *Trois Ilots*, where stands the church in which Josephine was baptized. A mile or two away is a large plantation (now far gone in decay), where stands the old building in which she passed ten of the happiest years of her life. The house in which she was born was soon after destroyed by a hurricane, and the Pagerie family took refuge in the upper rooms of this old sugar mill.

Nearly all the white inhabitants of Martinique are of French extraction and Roman Catholics; there is not a Protestant place of worship in the island, nor in the other French island of Guadeloupe, which lies north of Dominica. Many of the Creole residents have received their education in Paris, and one finds here all the latest modes and fashions imported direct.

But though the white Creoles dress after the prescribed European style, those whose ancestors once danced beside Afric's sunny fountains, at a period more or less remote, and who have African blood in their veins, much or little, retain the charmingly simple costume of the last century, called there the style of Josephine. The French spoken in these islands is more or less corrupt, and in many of the English islands a barbarous French patois prevails.

The characteristic types among the women of these islands are the octoroons, quadroons, and mulattoes, who are supposed to be of the class a little "off color," in habit as well as complexion. Their love of ornamentation leads them into extravagances of display hardly surpassed by any other people in the world. One of these women—a representative of her class—wore upon her head and about her neck more than \$500 worth of jewelry, all of gold. Her cylinder ear-rings were of gold, each as large as one's little finger, and stretched the lobe of the ear to an unnatural length.

Only one class may dispute the palm with them for lavishness of ornamentation. These are the East Indian coolies, imported for labor on the plantations; more numerous in Trinidad, and other English colonies than in the French islands. They wear rings, not only in their ears and around their fingers, but around their ankles and toes, and in their noses.

In this short paper my chief labor has been that of judicious selection, from a wealth of material, that the time at disposal will not permit me to wholly exhaust. My sole object has been to present as much of an idea of the region as possible in a given time. Martinique

and Dominica have been selected as types of the volcanic islands; entirely different, is the coralline isle of Barbadoes, which has the proud distinction of having ever remained (since its discovery) an English possession. It is one immense cane-field, and contains 160,000 inhabitants, most of them black, about 1,000, that is, to the square mile—the densest population known. It is the centre of hospitality and learning, and is celebrated for its college, which was founded by the famous General Codrington.

Nearest of the Caribbees to the South American coast is the island of Trinidad, discovered by Columbus on his third voyage, 1498. Looking, from the deck of his storm-tossed vessel, upon its triple-crowned mountain, he called it La Trinidad, "The Trinity." Its capital is Port of Spain, with broad streets, shaded plazas, and plashing fountains.

Its Botanic Garden is the finest of these islands; but a still greater marvel is the celebrated Pitch Lake, with its surface of bubbling asphalt,—the wonder of all who see it.

Standing upon the shore of Trinidad, the traveller might imagine his voyage but just begun; for right before him lies South America, the mysterious continent, its north coast dimly outlined across the Bay of Paria.

Here, right here, might a journey be projected, to end only at the Straits of Magellan, or in the upper valley of the Amazon.

For the great Orinoco here pours out its turbid flood, coming down from that golden country that Raleigh vainly sought in 1595—that island-capital surrounded by mountains glittering with gold, the mythic *El Dorado*!

In looking back over the ground we have travelled together, it is evident that much has been left unnoticed. In comparing the two regions, Florida and the West Indies, one is reminded of many advantages each possesses over the other; in the main, however, Florida would prove more satisfactory as a place of residence, because so accessible; that is, one might easily get away from it, when wearied with its dreariness; But, to quote from the author of *Paul and Virginia*: "If I might here yield to the charm of memory, I would dwell on scenes deeply imprinted in my own recollection;—on the calm of the tropic night, when the stars, not sparkling, as in our climate, but shining with a steady beam, shed on the gently heaving ocean a mild and planetary radiance; or I would recall those deep-wooded valleys of the Cordilleras, where the palms appear in lengthened colonnades." Our ideal paradise: Do we not imagine it to be in the tropics,—in a land, not of snow and storm—but of radiant heat and sunshine?

OVER THE MEXICAN PLATEAU IN A DILIGENCE.

BY

A. S. PACKARD.

Next to journeying on horseback, or in one's own carriage, a ride in an old-fashioned stage-coach, or a continental diligence—with its driver, its postilion, its frequent change of horses, and long stops at wayside inns for dinner; and the grand entry into town at the end of the day's journey,—a ride in such a vehicle was, when our century was younger than it is now, the only way to see a country, its people, and life and nature in all their varied aspects. And this is the best way to travel in Mexico. One can now, however, pass through Central Mexico in a parlor car, and from its windows glance at the scenery through which the train rushes day and night; or behold the lights and shades of Mexican life materialized in the specimens gathered about the station. We desired, however, to see a part of provincial Mexico from the top of a Mexican *diligencia*, drawn not by ordinary stage horses, but by mules; driven not by a Western Jehu, a modern Tony Weller, but by a Mexican Indian; aided not by a regulation postilion, but by a sandalled Indian boy in his loose cotton trousers and *sarape*. We desired not to stop for dinner at some elm-shaded, old-time inn, but to enjoy a Mexican dinner, with its many courses, either in an Indian hut thatched

with "maguey," or a village *meson*, or mayhap some more elaborate city *fonda*.

In his essay on "Riding Post" Montaigne tells us that on one occasion Cæsar "travelled a hundred miles a day in a hired coach," and he adds, "but he was a furious courier, for where the rivers stopped his way he always passed them by swimming, without turning out of his road to look for either bridge or ford." Our stages were from eighty to ninety miles a day, but we had no rivers to cross. We were to rise at three o'clock, starting before daybreak and riding twelve or fifteen hours till near sunset. We had to accomplish a distance of about five hundred miles in six days, passing from the beautiful town of Saltillo on the Sierra Madre of Northeastern Mexico across the eastern edge of the vast Mexican plateau, through scattered hamlets, villages, towns, through the rich city of San Luis Potosí, and finally through the picturesque, well-cultivated region between that city and the Mexican capital.

Having journeyed over the Western plains from Montana to Mexico, and traversed the Great Basin, it was a rare privilege to see the extension of the backbone of our continent into Southern Mexico; to cross in different directions the great plateau which begins in British America, grows higher as it passes into the United States, and culminates in the elevated region about the city of Mexico. On such a journey we could, in a superficial way, it is true, see the gradual change in the flora and fauna from Texas to Northern, Central, and Southern Mexico; hastily observe the surface geology of the plateau, and its mountain ranges, besides studying the habits and customs of the mixed people of Mexico. The season

was spring in the month of March, and on the whole this is perhaps the best time for such a journey, as the route is then neither too dusty, nor the weather always too hot.

Although San Antonio and the region from there to the banks of the Rio Grande was once Mexican soil, and though Old Laredo in Texas is by birth Mexican, yet the change to New Laredo on the Mexican side is magical. In five minutes after stepping into one of the little Mexican ferry-boats, one lands at the foot of a sandy bluff, and finds himself in a new world, or rather in a very ancient sort of society, among a people whose thoughts, aspirations, dress, and architecture ally them rather to some Eastern city of the Old World, such as a Moorish town in Spain, or Constantinople, Cairo, or even Morocco. The plaza surrounded by one-storied houses of adobe or of stone, the lounging men, the women half veiled by their *rebozos*, their dusky skins, long black hair, and liquid black eyes,—these features forbid our calling it simply a town of old Spain. Here were to be seen Spanish modes and habits engrafted on an Indian stock, which the traveller at once encounters after leaving the Texan border, and which make the transition more sudden and startling than if we had been in a moment transported from the United States to the plaza of some Moorish town.

Taking the narrow-gauge cars of the Mexican National Railroad on the morning of March 7th, we crossed the Rio Grande on a temporary bridge, at the Mexican end of which, in front of a small guard-house, stood two soldiers in the uniform, after this, to become so familiar,—a white cotton suit with a tall straight hat. We leave New

Laredo and pass out upon the plain. Already there is a change in the vegetation, which now becomes more varied than in Texas.

Botanically speaking, we were in the land of the mesquite. This plant has the habit of an apple-tree, and passing through a forest of it is like riding through an orchard of aged gnarled apple-trees. The mesquite, however, is an ally of the honey-locust and the sensitive plant or mimosa, and, like those plants, with long, sharp thorns, while its fruit is beans growing in clusters of long slender pods. The beans are imbedded in a mass of a hard white sugary substance like grape-sugar, but purer, and the Mexicans grind the dried beans and pods together into a nutritious meal. We often met trains of donkeys or "burros" carrying great loads of the mesquite wood, the pieces cut about two feet long, with not a straight stick in the load, which towers aloft over the donkey's ears. We were not to see a mesquite in flower until nearly two hundred miles farther south; but the tree, hung with clusters of rich yellow flowers among the delicate pinnate leaves, is a beautiful sight. A volume could be written on this plant, the prevailing forest and shade tree of the Mexican plateau. The mesquite shrubs and trees were now just beginning to leaf out, while the last year's pods were still on the trees rustling in the soft southerly breeze.

Another characteristic plant was the "prickly pear" or "nopal." The ordinary Texan species we left behind at the Rio Grande, but now a much more shrubby, taller, and larger species was to be our daily companion. We were told on the train from San Antonio that great leaves of the prickly pear are cut off, held on a pointed stick

over a fire so as to burn off the prickles and fed to cattle, and that last winter six thousand head of cattle were saved from starvation from being fed on the thick juicy leaves of this most forbidding of all plants. Soon after leaving Laredo we saw a high, small, narrow cart, drawn by a donkey, and loaded with *nopal* for fodder. Little did we imagine that prickly-pear salad was not many days after to be served up to us from the table of a Mexican fonda! The mesquite grows in scattered clumps, with broad open glades between, which were at this time thickly overgrown with a beautiful low yellow cruciferous flower, which carpeted the sward for miles on either side of the track. It was sometimes replaced by a violet flower of the same low stature, which covered the ground by the square acre.

Among the larger animals of the Rio Grande region is the peccary, which runs in droves through the "chaparral" or "brush," and is not uncommon even about San Antonio. We were also in the land of the wild turkey; while on the cars for Laredo a person told us that the day before a flock of seventy-five was seen, one of which weighed nineteen pounds when partly dressed.

The railroad rises very gradually from Laredo, which is only 438 feet above the Gulf of Mexico; the train runs very slowly, especially on up grades and around curves, for fear of obstructions on the track, placed by tramps or the vindictive or mischievous Mexicans, whose mud hovels are occasionally passed. Leaving Laredo at 8:15 in the morning, we expected to reach Saltillo in the evening, as the distance is only 240 miles; but the train stopped for the night at Monterey, a direful experience with obstructions and train robbers having proved

that it was unsafe to run the trains after dark. We therefore made the distance—172 miles between Laredo and Monterey—in nine or ten hours.

The railway soon ascended higher, cutting through hill-tops of a white, friable sandstone, probably of cretaceous age, and used in building the low, square, one-storied houses with flat roofs for the better class of people. These were situated here and there in clusters forming solitary haciendas, hamlets, and small villages. Towards noon a noble broken serrated range of mountains—the Sierra Madre—came in sight to the southwest, though the range was northwest and southeast; the outlines are much broken, the loftier dome-like peaks standing out from the long table-lands or *mesas*.

As we rose higher upon the table-land, our first Mexican yucca or *pita* was seen in flower. The *pita* is a tree-Spanish-bayonet, often a foot in diameter and ten to twenty feet high in this latitude. It sends up a thick spike of large snow-white flowers, which may be seen for miles; the wood is soft, somewhat like palm-pith or cork, but is of little or no use to the people. The plant when a little overgrown is a stiff, awkward tree, bristling with sharp, bayonet-like points, repellant to man and beast, and still more so to any one of artistic feeling. The ride early in the afternoon through a forest of *pit*as in stages of seeming awkwardness and decrepitude, some of the trunks prostrate, and few straight and regular, was a memorable one.

Before reaching Lampazos, towards noon, we pass a rather famous isolated table-land, which stands 2,000 feet above the surrounding country; it is accessible at only one point, and is twenty-five miles long and twelve

wide. This is the *Mesa de los Cartujanos*, and is a ranch with good water and grass. At Lampazos the train was besieged by troops of barefooted or sandalled men and boys carrying broad, shallow baskets of sweet cakes of three or four kinds, and home-made candy, either in cakes or wrapped in paper cones. Here the peaches had begun to flower. Just beyond this town we saw the first *aguey*, aloe, or century plant, hereafter to be so familiar a roadside acquaintance. The track now and then crosses the old trail cut through the mesquite growth by General Taylor while on his march from Matamoras to Monterey. Riding through the mesquite brush or "chaparral" is no small undertaking. It is said that the land surveyors lay out the ranches or farms by triangulation from the mountain peaks, establishing their base lines on the mountains to avoid the thorns of the dense mesquite bushes and trees on the plains below. Certainly the peaks were very conveniently placed for this purpose, and are not particularly inaccessible.

At Bustamante the train stopped for dinner, which was served in Mexican style; *frijoles*, *chile*, and *tortillas*, with boiled tongue, constituting the repast. Then our train goes leisurely on up a steep grade through characteristic Mexican scenery, over plains of low mesquite bushes, with the *pita* towering ten or twenty feet above the general level, with serrated mountain ranges in the distance; open glades, carpeted with yellow or lilac flowers, forming the foreground. The cars shot past groups of cattle feeding on *nopal* in front of mud hovels, the men and boys in their high-colored *sarapes*, and the women in their *rebozos* drawn partly over their faces; and passing through such scenes as these the train enters Monterey, situated 1,790 feet above the Gulf.

Monterey is a town of 30,000 inhabitants, and is more picturesquely situated than Saltillo. Taking a carriage and interpreter we "did" the city, and from the top of the state-house had a view of the town and its surroundings. The gardens were numerous, enclosed in high walls, above which rose the rich dark foliage of the "butter-pear" and evergreen trees; the poorer houses or huts in the outskirts were made of canes, the roof thatched; the vegetation was rich and abundant, and a contrast to the still leafless suburbs of New Orleans and San Antonio we had so lately left behind us. Night fell and found us on the hill behind the town taken by General Worth during the battle of Monterey. We could see the route by which General Worth in the night made a detour over a flat plain to this hill, on which is the bishop's palace, now in ruins and used as barracks. Up the steep hill he drew with mule teams a number of 30-pound cannon, ten of which we counted lying about the summit of the eminence behind the stone walls and ruined breastworks. From this point Worth threw shot and shell a couple of miles over into the city; withdrawing into the city our troops fought the Mexicans from street to street and square to square until the whole city and garrison were taken. In the mist and darkness we returned to our hotel and supper; our room, a typical Mexican *cuarto*, very high, dismal, damp, and forlorn in wet weather, but undoubtedly well adapted to the sunny, hot Mexican weather of the spring months. The ceiling was of cedar, while the bare floor was laid in cement.

The next morning we drove in the rain to the railway station, which, as throughout Mexico lies a mile or two out of the town; the muddy road was lined with

hedges of *pita* shading the broad ditches; flocks of the boat-tailed grackle rose from their borders and alighted among the sycamore trees, which were now in full leaf, while the mesquites were hung with clusters of rich yellow flowers. The Indians, or rather Mexicans, whom we passed were hopping through the deep black mud in an ungainly fashion, their sandals clapping and almost falling off; their *sarapes* thrown tightly about their shoulders and drawn partly over their faces. One boy was a picture; he wore over his head for protection against the rain a *petate* or straw rug, one end hanging down to his knees. This reminds me that afterwards at Cordova I saw a little Indian boy walking through the drizzle with an impromptu poncho made by tearing a hole lengthwise in a banana leaf.

Soon after leaving the station and getting out into the country we passed through new kinds of shrubbery: strange cacti, some spherical or dome-like, studded with red flowers and half buried in the gravel; others tall and branching with bright yellow flowers, added to the interest of the ride.

We reached Saltillo, which is 5,204 feet above the Gulf, by mid-day, and put up at an American restaurant situated opposite the largest plaza, where we received excellent attention. Here we spent Sunday and Monday, the weather cool and damp. Monday night, at the suggestion of our hosts, we changed to the Mexican hotel, San Stefano, whence the diligence was to start in the morning. Myself and companion * had in the afternoon booked ourselves for the ride outside to San Luis Potosí. For one room and a cup of chocolate and piece of bread in

* Prof. J. W. P. Jenks, of Brown University, Providence.

the morning before starting we were charged two dollars apiece. This seemed very exorbitant, as the charge afterwards was uniformly two dollars for a late dinner, lodgings, and chocolate in the early morning. As at all Mexican *mesones* or second-rate hotels, the diligence, which is built on the plan of a Concord coach, but rather stronger, is kept in an inner courtyard into which open the stables and other outer apartments. Awake at three, by four in the morning the shaking and clanking of the chains belonging to the traces, and the lumbering roar of the coach wheels over the rough stone pavement of the inner and outer courtyards were sufficient notice that the "stage was ready." We see that our carpet bags and valises, as well as basket of cold provisions, are put aboard; our driver, in his poncho, a *sarape* with a hole in it through which the head is thrust, takes the reins; the restless mules make a sudden start, the noise of their iron hoofs reverberating through the damp corridors of the *patio* or court, but are kept well in hand; we finish our chocolate, navigate from the hub to the rim of the wheels, clambering over the steps to our seat aloft behind the *cochero*. As the mules dash through the door-way the whipper leaps into his seat by the driver, and we gallop at a desperate rate through the narrow dark streets, past the now deserted market-place, through the plaza, through other long narrow streets, keeping a careful lookout for the street lanterns hanging on wires in the middle of the starlit streets at just the right elevation to knock off the hats of such of the unwary passengers as are on the upper seat. And so we rattle on, the driver and whipper both lashing the mules, the coach dancing up and down, swaying from one side to the other as it jolts over the rough

pavements, until we leave the re-echoing streets and emerge upon the highway over the plains.

The mists and clouds of the previous day had cleared away; the road was now lighted by a bright full moon, but the morning was damp, cold, and chilly and remained so until nine or ten o'clock. Long before daybreak strange, ghostly forms were astir; men and women going to market from their country hovels and ranches, and bearing strange burdens, loomed up in the darkness; they were mounted, while trains of donkeys surmounted by colossal loads of hay or wood, would separate themselves from the gloom and darkness and approach us as if uncanny shapes born of the early morning shades. To add to the dismal features of the scene a cross would at times rise by the roadside from out of a pile of stones thrown up to mark the grave of some murdered man. At about daybreak we drove through the narrow pass of Buena Vista, which is seven miles from Saltillo. It was light enough to see how strong was General Taylor's position on the morning of the 23d of February, 1847, when in answer to Santa Anna's demand for unconditional surrender, he briefly answered: "I decline to accede to the request." On our right the road ran but a few rods from a broad deep gully or *arroyo*, forming the precipitous bank of a stream now nearly dry; while on the left, standing out from the mountains bounding the eastern sides of the valley, the road curved around the end of a series of high rocky ridges and crags, over which even infantry could with difficulty have climbed. Here General Taylor with 5,200 men repelled the Mexican army of 20,000 under Santa Anna, which retreated in the direction of San Luis Potosí.

The hamlet of Buena Vista, which is over a thousand feet higher than Saltillo, comprises a few houses not distinctly seen in the early light. For a few miles on, the road was rough and up-hill to Agua Nueva through rocky passes, with an occasional mound and cross, marking the place of some murder; then we drove out upon broad, level plains called La Encantada, or the enchanting plains, succeeding one another to La Ventura and the villages beyond. The mountains bounding the river were regularly conical, usually covered with mesquite to their tops, but in one case, and the only one seen during the journey, clothed with a sparse growth of *piñons*—a small pine.

Towards La Ventura the scenery grew tame, the plains widening out for miles in width; the monotony of the route was at one place relieved by riding through extensive "dog-towns," the little marmots being remarkably fearless. Indeed throughout Mexico we remarked the tameness of the eagles, crows, and other birds; it is evident that the youthful male Mexican does not go "gunning," and though nearly every adult wears a pistol they do not disturb the birds or beasts by the roadside. Cruelty to dumb animals takes with them another form—that of unmercifully beating their mules or donkeys.

At La Ventura, which we reached at about five, we stopped for the night. There is but one inn or *meson*, here, a part of the hacienda. This station mainly consisted of two large blocks of one-storied houses, forming two sides of a square, each one enclosing a large courtyard, and forming the ranch of General Treviño, a Mexican celebrity in these parts, whose house, or *casa* had been pointed out to us at Monterey. Here we had good rooms and a good bed. While waiting for dinner, which through-

out the route is never served before eight o'clock, however importunate the tired and famished traveller may be, we surveyed the enormous tank in the rear of the ranch, where Indian women were drawing water in their *ollas*, or huge water-jars of earth, which they gracefully carried on one shoulder. The water is pumped from a well by a modern windmill. The ranch is an oasis in a dry desert, and a few willows and mesquites rise above the low, flat, white walls of the ranch, the bit of green being visible for miles before the diligence finally draws up in front of the huge portals guarding the entrance to the courtyard. Our dinner was at last served; the courses were tender beefsteak, tripe broiled in cotton-seed oil of a peculiarly nauseous flavor, rice served either with the same kind of oil or soaked in melted lard, and frijoles, or beans, with the tortillas tossed in a heap on the tablecloth in front of each plate. Fortunately the aboriginal, New Englander's love of baked beans had never wholly died out; it had smouldered for years: the ardor of our early attachment now flamed forth anew under the stimulus of a twelve hours' ride over hill and plain, and we did then, and on similar occasions for weeks after, full justice to this national dish of Mexico. Like the coffee of the country the beans are usually well cooked; not baked, but boiled, not served with pork, or supplemented with brown bread; not seasoned with black pepper and vinegar, but with *chile*, or red pepper,—another of the national dishes not only of Mexicans, but of Peruvians and other peoples from the United States border to Patagonia. The chile-eating, bean-boiling, and tortilla-frying folk are to the New World what the rice-eating peoples are to the Old World; they mark the transition from a flesh-eating

race of savage hunters to the vegetarian as well as carnivorous races of mankind, making their first step in the direction of civilization. If at first we were prejudiced against Mexican cooking, our repugnance soon became ameliorated, the cooking perhaps improving as we went south, and it contrasts most favorably with the average American railway restaurant along the Western transcontinental routes. Though it thundered and rained in the night, the early morning, lit by such bright stars as are not seen in a northern firmament, was before sunrise cold and chilly; but as the sun lighted up the road, the air grew deliciously soft and balmy, to become hot and dry before noon.

The diligence stops for breakfast at the *Hacienda del Salado*. Shortly before reaching it we passed the fresh grave of an American who had been killed and buried by the roadside two months previous. No cross marked the heretic's resting-place. It seemed better to pass such an object when the sun was four hours high than in the chilly gray of the early morning. We met with other crosses along the road: one by a steep arroyo, down which the road plunged, was sacred to the memory of a person who had been killed by the upsetting of the diligence, as our driver told us by signs; others may have been erected to those who had perished by other means than the dagger or pistol. From Saltillo to San Miguel we happened to see no suspicious persons, though most lower-class Mexicans have, at first sight, a cut-throat air. At the various stations, when the diligence changed horses or stopped for meals or the night, we walked freely about, unarmed, in the outskirts of the hamlets and in the streets of towns and villages. Within a few years, under the late liberal gov-

ernments, law and order have been strictly enforced over the stage routes in Eastern Mexico. The rural guards and the excellent police system in the cities, the more stable condition of affairs, and the ease with which life may be sustained in this region, have conspired to diminish robbery and murder along the stage lines. After leaving Saltillo we felt safer than on the border; in Texas one's life and purse are less secure than in the more frequented portions of Mexico. Even now, as in former years, travelling on the Texan frontier is in a degree unsafe; the cow-boy and horse-thief terrorize trains, homesteads, and ranches. The State rangers and local government still lack efficiency, and it is a national shame that on our frontiers life and property are in the year 1887 little safer from brigands than in portions of Western and Southern Mexico, or from the vendetta in Corsica or the camorra in Sicily. The thought often occurred as we rode along: "If even in New England a mound and cross marked the grave of every murdered man, would they not be quite as frequently met with as in Mexico?" In Mexico everybody carries a large pistol; it has taken the place of the sword as part of a gentleman's costume. It is worn both by the traveller and the cocher on the lonely stage routes, as well as by the clerks in the streets of the Mexican capital. We never saw one pulled out of a case, or heard a pistol-shot by night. Throughout our week's ride we saw but little drunkenness, no quarrelling, and heard by night no sounds of revelry or brawling; the respect paid by the lower classes to those of the upper, the Castilian politeness and native good-breeding exhibited, was a pleasant feature all along the route of travel. To see two Spanish gentlemen embrace each other is an education.

At Saltillo we saw a man under the influence of either *pulque* or *aguardiente*, but he was but one of hundreds of sober people to be seen swarming about the drinking shops at the street corners.

Reaching the village of Salado at ten we stopped an hour for a late breakfast. This is a typical Mexican town; the exteriors of the better class of houses were washed in blue and green, and on the walls of a public building, perhaps the town-hall, were painted life-size groups illustrating historic Mexican scenes. The streets and houses presented a very neat appearance, and as we drove in, the women were finishing sweeping the plaza with switch brooms. The village is situated on the eastern border of the vast Hacienda del Salado, which was said to cover an extent of 2,500 square leagues. The broad fields are fenced in by deep, generous ditches, the most economical fence in this country, whither the abomination of wire fences has not yet penetrated. Across the ditches are here and there thrown stone bridges of great solidity, calculated to endure for centuries. The fertile arable land, now dry and parched, sweeps interminably to the westward. We visited a quaint old well, which was very deep, at least fifty feet, the opening not being circular but elliptical, being eight feet long and two feet wide; the water is brought up by a series of revolving leather buckets by two cog-wheels turned by a crank of one dilapidated mule power; the well is shaded by a high square adobe structure, while the water runs into a large cemented adobe tank where the stock, numbering over 10,000 head, is watered. At the other end of the village is a similar well and tank. This well is typical of many others we saw on our route, and is, in principle

and structure, exactly like those in Egypt and other Oriental countries. Over smaller wells, where the water is drawn by hand, there are two solid upright posts of adobe or stone, connected by a bar, on which the well sweep is hung.

The men spend their leisure in cock-fighting, as we saw favorite cocks tied by a string to the entrance of the houses, some of them armed with murderous-looking steel spurs. A cock-fighter, or *gallero*, was seen with his game-cock in his arms, perhaps on his way to some impromptu cockpit.

In strolling through the main street we passed by the open door of a school-house for young children, who were studying aloud their A-B-C's. As we stopped at the door, we were very politely accosted by the teacher, invited in, and as we entered the children all rose to greet us. The interior was mediæval enough; the children sat on short, high benches, conning their A-B-C's from large cards hung upon the walls.

As the diligence was about to start, a tall, well-proportioned, fine-looking Spanish country gentleman, or *hacendado*, dressed in jacket and trousers of neatly starched and ironed gray linen, and a handsome, broad *sombrero*, addressed the driver. In provincial Mexico, at least along our route, except in the larger cities, the Spanish creoles, as well as the mixed Indian and Spanish races, or *Mestizos*, have not yet adopted the European style of dress. The variety in shade of color of the men's blankets, or *sarapes*, was endless. They are all hand-made, and here and there we passed great heavy looms, such as one still sees in out-of-the-way farms in northern New England, where the men—not necessarily the

women—were weaving these blankets. The favorite color is a bright vermilion red, the dye probably extracted from the cochineal insect; but there were also shades of blue and brown on a white ground. In a group of a dozen men, no two *sarapes* will be alike in pattern. But, however a man may be dressed, whether barefooted, and with torn and soiled trousers and shirt, the sombrero, or broad-brimmed hat is faultless. The native extravagance of these people, aside from gambling, is displayed not in clothing the nether extremities, but in furnishing the head. Ten, fifteen, and even twenty-five dollars are paid by Mexican dudes for sombreros. The richer hats are of gray felt covered on the rim and crown with silver cord, over which are embroidered heavy rosettes, or various ornaments called *chapetas* are attached to both sides. Horsemen wear jackets and leather over-trousers, open and very loose at the bottom, with a double row of Spanish silver quarters, or large silver buttons, from the high-heeled boot to the hip; the waistcoat is cut low, and often a bright-red sash completes the costume. The pictures one sees in books of a gay Mexican horseman, or *caballero*, in this costume, with enormous spurs and stirrups, and broad-brimmed sombrero, we often saw realized. We would occasionally pass a solitary horseman, not dressed in holiday attire, but invariably with a sword, or *machete*, dangling from the bow of his saddle. On Sundays and feast days the display in San Luis Potosí of gayly dressed horsemen is notable.

This day's ride was particularly fine; the sky was clear, and the sun hotter than before, as we were getting farther into Southern Mexico. The noble conical mountain *El Fraile* was in view all day; it forms the southern ex-

tremity of a ragged sierra. There was also to the southward a magnificent serrated range running east and west as if blocking our path, and on the right two villages, their white walls glistening in the afternoon sun, nestled at the foot of the range. We drove through forests of pita, some of the trees perhaps thirty feet high. We now had more passengers inside of the diligence, among them a Señor Cortes, one of the descendants of Fernando Cortes, the family still owning extensive farming and mining grants handed down by the conqueror. A day or two later a Señor Cervantes was among the passengers within. the obliging *cochero* showing us his name in the way-book.

As we went further south the country became more populous, especially on approaching or leaving the towns. Over the broad plains were scattered droves of cattle, herds of horses, and one day we drove through a herd of hundreds of breeding jacks and jennies, and sometimes herds of jennies with their foals, scarcely larger than the jackass rabbits, at times seen galloping through the chaparral or brush. Our roadside companions were of all sorts and conditions, men and women carrying vast, unwieldy burdens of produce, huge, high baskets of live poultry, or native earthenware. I once lifted one of these three-storied baskets carried by the men on their backs; it was difficult to raise it from the ground, and it must have weighed a hundred pounds, but these stout Indians trudge along for days, at the rate of twenty miles a day, with such burdens. A man will carry for a short distance, on his back, burdens of from two to five hundred pounds, if they are well balanced. We heard of a man being crushed by a load of seven hundred pounds which got out of balance as he tripped and fell. Mexico is not a

country of express carts or of wheelbarrows, and Indians are employed to unload grain cars and heavy freight, as well as to change baggage along the railroads. We have been astonished at the loads of trunks and freight carried by porters at the stations on the Vera Cruz or Mexican railways.

We occasionally passed families travelling, gypsy-like, in queer, high, narrow carts with cane huts overtopping them; at noon-day they bivouacked by the wayside, the cattle straying about, feeding on nopal, or spears of stiff grass, or the leaves of the mesquite; the men lying on their backs in the shade of a yucca, while the women were grinding corn on their *metates*, or grindstones, or making tortillas. Passing by the open huts of the villages, towards noon, our ears would be saluted with the clapping of hands, not intended to salute the diligence, but an involuntary concert made by women manufacturing tortillas, which is done by mixing wheaten flour with water, patting it between the open palms into a broad, thin cake like a New England "flapjack," and then baking it in a pan over a meagre charcoal fire. The tortilla is pure wheat bread. Often in passing through a village did our cocher and whipper draw up the coach and wait for some "lady friend" to hand them a bunch of tortillas. The flavor of the tortilla is often enhanced by smearing one side of the cake with a thick layer of red pepper, or *chile*. Our driver would graciously receive a tortilla thus prepared, roll it up, and eat it, *con mucho gusto*. If an Arab can live a day or two on a handful of dates, a Mexican can make a hearty meal on a few tortillas, seasoned with that most pungent of condiments, *chile*. We could never get interested in tortillas; they are said to

be highly nutritious, but are as tasteless as would be baked pulp from a paper-mill.

Our lodging-place for the night is Cedral, which lies at the base of El Fraile. This is a town of about 4,000 inhabitants, with several reducing mills on the outskirts, the silver ore being brought from the mines at Catorce. Entering the town we pass through gardens, now being planted, with well sweeps for drawing the water from deep wells, since there are no streams near the town. Here our entrance into the plaza was particularly grand; the driver unmercifully lashed the near mules; the nimble whipper jumped off the seat, ran for a half mile by the side of the leaders, now belaboring their flanks with the butt of his cowhide whip, or picking out soft spots in their ears or on their necks; a boy-whipper, for there are sometimes two in difficult portions of the road, followed suit on the other side; the mules respond with kicks. We dash through the streets, the coach swaying this side and that, and we holding on to the seat-rails for dear life; the men on foot with trains of donkeys hustle them out of the way; women rush frantically into the streets after their black-eyed babies all unconscious of approaching danger; the older children crowd into any chance recesses by the door-ways; we turn a corner at full speed, dash past the market-place and the church, and finally draw up with a sudden halt before the *Diligencias*, a one-storied hostlery, our resting-place for the night. But it is not late in the afternoon, only five o'clock; the sun is still high and his rays hot, filling the streets with floods of light. The street scenes are characteristic; the white walls of the one-storied blocks are unrelieved by any green shade, and contrast with the wonderfully deep

azure of the sky overhead ; but the chalk-white streets are enlivened by the bright-red skirts of women in black or blue *rebozos*, and by the varied red *sarapes* of the men. How many times did we long for a portable camera to take instantaneous views of the many sights and personages we met in the streets and by the roadside. The plazas, however, are in all such towns well shaded with trees. The church was a large one, open all day ; the women, and occasionally the men, go there to say their prayers. The church architecture of Mexico is uniformly good ; the eye rests satisfied on the square tower with its rounded top, and on the well-proportioned dome at the end of the structure ; the church fronts are imposing, and so is the view of the interior. As we entered, the vesper service was going on. The organ was tolerably well played, but the singing was shrill and by no means pleasant, and it was not our good-fortune to hear any good vocal church music in Mexico, whatever the guide-books may say to the contrary. Multitudes of *ex votos*, of all sorts and descriptions, hung on the walls within the entrance, and the pictures were large and numerous, but not notable as works of art.

We then stroll through the market-place in front of the church. On one side are the booths with oranges, limes, lemons, vegetables, earthenware and hats for sale ; all the articles are such as can be brought into town on the Indians' backs or on donkeys ; in the open places sat women by the side of little heaps of *chile* or red peppers of various shapes and sizes, of onions, lettuce, and other vegetables.

The office of the tavern or *meson* is on the right as we enter, and opposite is the post-office, our landlord offici-

ating as the postmaster. The meson is part of a block, and beyond, opening out into the *portal*, a sort of arcade, are the stores, where huge loaves of bread, crackers, and sweet cakes are sold over the counter, with cotton cloth by the yard, serapes of all colors, and pulque; beyond are meat-shops and grain-stores, with perhaps an apothecary shop.

We immediately ask for a room, or *cuarto*, and we are shown into a huge dark room, perhaps twenty feet square, refreshingly cool after the hot day's ride; but the room is unfurnished save with a single narrow bedstead, which is little more than a pine bench; after a while a *mozo*, or man-servant, brings in a thin mattress, not much softer than the solid board-bottom of the bed; he then brings in a pair of sheets and a single blanket; if the traveller wants more bedding he must carry a blanket with him; it is not customary to furnish more than one blanket either in town or city hotels; finally a pillow is placed at the head. Perhaps another *mozo* or a boy brings in a wash-stand, after that a bowl and pitcher; if soap is asked for it is supplied, so are towels and a dressing table, as well as candles and matches, and finally the room is made ready for the impatient guest. It is a significant indication of the moral status of the country, that hotel rooms in villages and country towns are nearly always unfurnished with any thing less portable than a bedstead; the doors are unlocked, and any one might enter and carry off loose pieces of furniture through the courtyard doors; the windows are iron-barred, since they are usually low and open directly upon the street; in some *mesones* the rooms are without a window and only lighted by the door opening into the *patio* or courtyard.

In the centre of the *patio* is a plot of earth with flowering japonica or orange-trees; drains pass out of doors; we have often had to shut our doors to keep out errant sows with their numerous progeny, or hens and chickens; or mayhap a curious parrot looks in to see what the new-comers are doing. It is also significant that throughout Mexico the chamber work and attendance is done by men or boys; girls are carefully shut up and kept out of the way, and not allowed to be out of sight of their mothers. There is a good deal of pilfering done in a Mexican village; and the bolts and bars, the grated windows, the universal pistol are noteworthy signs of the mutual distrust of one's fellow beings. But to be charitable, this is in large part a survival of the olden time, the days of street fights, sudden revolutions or *pronunciamientos*, of assassinations, and wholesale robberies, which were of frequent occurrence before the days of the republic. The building of railroads, the liberal ideas of Gonzales and Diaz and their administrations, the freer intercourse with the rest of the world, have already had an ameliorating influence. We often found it impossible to lock our doors with the great keys of the big mediæval locks, and trusted to the honesty of the guard, who at dusk locks and bolts the vast, thick, carved oaken folding-doors of the outer courtyard, and sleeps in his movable cot behind the door, where he can, without getting out of his bed, unbolt the door for late comers. Within these strong portals are safely locked at nightfall the landlord, his family and guests, the diligence and the mules, the driver and whipper, who mayhap are snoring on a straw mat or *petate*, laid down on the stone floor of the hallway, as well as the sow and pigs, the cattle, horses, dogs, fowls, and parrots. The meson is a castle; street

fight may rage without, the bullets fly about the plaza and above the courtyard, but within the thick stone or adobe walls all is peace, quiet, and safety.

Rising the next morning at three o'clock, the diligence started at four, about two hours before daylight. The dawn of day in this tropical region is a sudden lighting up of the earth. All through the south the sunrises and sunsets had been gorgeous. This morning there was a singular sunrise. The sun first shone on El Fraile through a rift in the fog, and then suddenly lighted up the entire mountain, while the fogs still clung to its base, the very noble peak appearing like an island rising out of a troubled sea.

We stopped to change the mail and mules at Matehuala. This is a compact town of 15,000 inhabitants, with narrow streets and a small crowded market-place, where were to be had delicious oranges, bananas, and ripe tomatoes. The booths almost concealed the base of the monument erected to the memory of the Indian patriot, Hidalgo. The church was a singular but interesting structure.

The ride to-day was a magnificent one. The road led through hedges of tall cactus along the eastern base of El Fraile, with rich silver mines on the mountain slopes, the ore being reduced in Matehuala. An interesting feature is the elaborate stone walls which for miles bound the different haciendas, and run along the tops of the mountains of Catorce (a mining town, so called from the Spanish for fourteen, as a band of robbers of that number once dominated this region) or across them, neither deviating for precipices or cañons. Near the town the prickly cactus and forbidding maguey are planted in sods on

top of the walls to keep out intruders. The road was rough, hot, and dusty, and discarding our umbrella, we pulled up the canvas top with which the diligence was provided, and this made a cool, breezy shade, but, of course, cut off most of the view.

We took dinner at a miserable Indian hamlet, in an adobe hut thatched with maguey leaves, and with a hard mud floor; the meal was neatly served in courses by an Indian woman, but only the frijoles relished, the soup being made with the execrable cotton-seed oil of the country. Our companions at table were a colonel in the Mexican army, and a Spanish creole.

The plains were now broken up by rough, jagged, volcanic outflows of a porphyritic, felsitic rock, which had broken through the soft white limestone surface rock, and from this region southward we were to pass through a region abounding in extinct craters and lava streams of tertiary age. The mesquite-trees bearing overgrown bunches of mistletoe, which had been seen by the roadside for a day or two, were now hung with masses of a tough brown orchid.

We drove into Charcas by half past five. This is a town of 2,000 inhabitants, 91 miles from San Luis Potosí, with which it is connected by telegraph; it has two good churches, one of which was open and of the usual imposing exterior and interior. The meson was a good one, the attendance well trained, and an excellent supper was served, consisting of soup, rice, roast-beef, lettuce, chickens, frijoles, and tea, each dish forming a separate course, the plates and knives and forks for each course, as usual, being placed in piles by the guest at the beginning of the meal. Our large, lofty bedroom had no window

in it, and though it seemed musty and damp, we took no cold by sleeping in it.

The next morning we had our chocolate and cakes at four, starting at five in the starlight, and after a gorgeous, rosy sunrise we drove through haciendas and small villages, with aqueducts, well sweeps, and gardens abounding in peaches and cherry-trees in bloom, and hedged by a singular quadrangular cactus about six inches in diameter and six to fifteen feet high, with rows of yellow flowers growing from the projecting edges. This kind of cactus hedge was seen all the way to the city of Mexico, and is a unique sort of fence. We now met Indians and half-breeds of all sorts and conditions; some leading donkeys loaded with hay, in great onion-shaped bundles, one on each side of the burro. Then there were whole families, men, women, and children "moving," each one with various household utensils and articles on their backs. At Venado, where we changed horses, we had time enough to look into an excellent church, with a good organ and pictures, while the plaza was shaded with trees, under which were inviting-looking seats of adobe and cement.

Flocks of Mexican quail were observed running along the roadside in the country, with an occasional raven and brown-tailed hawk; all very tame, as were the omnipresent boat-tailed grackles.

The yucca or pita trees were now larger; one monstrous tree was three feet in diameter. The fig-trees were already nearly leafed out.

We stopped twenty minutes at Moctezuma to change mail. Here were vineyards just leafing out, and hedged in by a singular spiny six-edged, tall cactus, and here

and there by a tall tree-honeysuckle with bright yellow flowers. The small, densely crowded market-place was rich in characteristic Mexican scenes. The beggars, or *léperos*, blind, lame, and halt, swarmed like flies, and more than rivalled, in their importunity and disgusting appearance, those of Rome and Naples. The road south of this town was very hot and dusty, but the scenery was exceedingly fine. The rough hills are of red porphyry, and over their summits coursed walls of columnar reddish trap. A new branched cactus, like a giant candelabrum, was now seen for the first time, and we stopped to leave the mail at a ranch, where were singular ecclesiastical-looking, conical white granaries of adobe and stucco, about fifteen feet high, and surmounted by a small wooden cross. Again changing mules at half-past ten—there were usually four changes each day,—we drive through superb scenery. The road lay over very extensive plains, the bottoms of former lakes, for in quaternary times the plateau of Mexico must have been covered with broad shallow lakes, bordered by mountain ranges. Passing over the height of land separating one lake basin from another, the traveller looks southward over a wide expanse with scattered clumps of mesquite or cactus. The road stretches away for miles, and along the sandy tracts and side roads rise lofty columns of swiftly moving dust and sand. I have counted ten or twelve and sometimes more of these strange travelling columns—some of them fifty or sixty feet high—whirled far aloft by the eddying wind.

At noon we passed the Hacienda de Boca, which formerly was a church and convent. These structures were beautifully situated, and the main road passing them on

the right was hedged in for a mile or more with tall six-rayed cacti, some of them twenty feet high. The water is brought in canals from the picturesque volcanic mountains which flank the hacienda. Trains of burros were nooning in the shade of the mesquite and the *huisache*, a beautiful tree now not uncommon, something like a mountain-ash, with similar clusters of shiny red berries, but growing nearly as large as an elm. There was also an occasional poplar and hickory tree, the first we had seen in Mexico. As we approach San Luis Potosí, which, however, was all the afternoon hidden in a valley at the foot of a high range of mountains, we meet more footmen and donkeys. The heat was now sensibly increasing as we went south, and the men and children's dress, or rather the lack of it, was adapted to the change in climate, the little dusky urchins going about without a rag upon them, while the laboring men only wore their shirts.

San Luis Potosí is not seen from the northward until shortly before the limits of the town are reached, and then its numerous church towers and white walls rise picturesquely out of masses of rich green. The wayside travellers, men and women, on foot or on donkeys, with rarely a horseman, increased in number. We drove at a killing rate through the long narrow streets leading into the middle of the city. The city is well situated, lying in a broad plain at the foot of a lofty sierra, for centuries rich in mines of silver and gold. The hotels are excellent, and the city is healthful—far more so than the city of Mexico.

We accomplished our day's staging of ninety-one miles fortunately by five o'clock, so that we had a couple of

hours of daylight to see somewhat of the city, whose population numbers 45,000. We wanted to lie over here one day and rest, but it was impossible, as the diligence does not travel on Mondays, and we could not make our connection with Mexico. Fortunately, as we alighted in the gateway of the hotel, we met Mr. George B. Clark, the American Consul, who was expecting a friend on the diligence, who, however, did not arrive, so he gave up the room engaged for his friend to us, and kindly devoted himself to us that evening, visiting with us the two noble churches of El Carmen and San Francisco, much more interesting than any we saw in the city of Mexico. In one of them Bishop Oca, the most distinguished clerical in Mexico, was then preaching to a large audience. The plaza, crowded with trees in fruit and flower, with a central fountain, the Calzada, and the wood-market-place, were visited. We saw some of the finer streets and residences, catching glimpses of the better portions of this famous city, and after an excellent dinner we strolled for an hour listening to the admirable Mexican band stationed in a pagoda near the centre of the small and densely crowded plaza, next to the large monument built in honor of the patriot Hidalgo. The music was excellent, the audience was mostly men, with a few young women, some of them very pretty. There are but half a dozen Americans in San Luis, but a good many Englishmen, French, and Germans. The principal literary and scientific personage in San Luis is Dr. G. Barroeta, who has travelled extensively in the States, and from whom we had in former years received the honor of a visit. Unfortunately, he was, at the time of our arrival in the city, at the New Orleans exposition, as one of the Mexican Commissioners.

Retiring at eleven, after a delightful evening, we rose the next morning at three o'clock. Never shall I forget the street scene that early morning. Two stages were going to leave at four, while ours for the south was not to start until five. But, awakened by the rumbling of the coach wheels and the clattering of the iron-shod mules on the pavements below, I got up after the first stage had started, and looked out of my window. It was in the second story, and I could walk out upon the iron balcony in the soft, balmy night air, and look down into the narrow street below, which was lighted by two blazing torches made of thick maguey rope covered with lumps of pitch. As the second diligence drove away up the narrow, dark street, the driver lashed his mules, and the whipper, seizing one of the burning torches, ran for perhaps a quarter of a mile along the side of the stage, whipping the forward mules with one hand, and holding his flaring torch aloft in the other, from which showers of sparks flew about the stage and fell upon the pavement in a glittering train.

Our route led us by the Hacienda of Santa Maria. Here a gang of Mexicans and Indians was at work, to use an American expression, "hauling dirt." But this is a solecism. They have no dirt-carts; a tip-cart or wheelbarrow is a thing unknown either in provincial Mexico or even in the capital, and they put the dirt in saddle-bags, carrying it off on the backs of donkeys. I have seen gangs of men at work in the Calle de San Francisco in Mexico taking the dirt away on their backs in gunny bags of maguey fibre.

Passing through plantations of the maguey plant thousands of acres in extent, flanked on one side by the

Sierra Bernal, we stop for dinner at San Francisco, a small town with a pleasant, shaded plaza and colonnade. Not far from town the road passed through a grove of the largest mesquite trees yet seen, the trunks measuring from fifteen to twenty inches in diameter, and from thirty to forty feet high; they had the habit of gnarled oaks. During the whole afternoon we drove through the vast Hacienda El Jaral, a broad, flat, rich, fertile, well-watered and cultivated plain, formerly the bottom of a lake, surrounded, except on the north, by high sierras. The building itself was palatial in proportions and architectural appearance. It was two stories high, the front of handsome reddish freestone, and at one end was the large chapel. Workmen were repairing the interior, and it was astonishing to see what great blocks of stone the *peons* would carry on their backs. Across the way, in the rear of a large church, was an elaborate raised threshing-floor of adobe and cement, with an inclined drive-way for the entrance of the cattle, which are driven around the enclosure to trample out the grain; next to the floor were four large conical granaries, with a door at the bottom and an opening for ventilation pierced through the wall above.

When the diligence started, the proprietor of the hacienda took a seat within; he was a handsome, well-bred, elderly gentleman (presumably a son of the Marquis de Jaral), and was dressed in the costume of the country—a jacket and trousers of dark cloth, and a drab sombrero. His nephew had got on to the upper seat of the diligence at San Francisco. He was a well-educated, amiable young man, who could talk Latin, so that we could make a little conversation between a few Latin

words and a slight smattering of Spanish on my part. He gave San Miguel, which we were to reach to-morrow night, a rather hard name, remarking, with significant gestures, that *ladrones* were pretty plenty in and about the town.

The road out of this pleasant valley, after passing by scattered huts of peons, with their long-legged black pigs, forlorn-looking poultry, and pretty, black-eyed, but very scantily dressed children, wound up a long, high hill, almost a mountain, which formed the outlet from the deep, trough-like valley of Jaral. The entire western and southern sides of this enormously extensive ranch were enclosed by an elaborate stone fence, which extended over the spurs of the sierra as well as the plains. In the palmy days of Spanish rule, fifty years ago, this hacienda was the largest farm in the world, was cultivated by hundreds of peons, and supported 300,000 head of cattle and horses. We then crossed the range, rattled down over the southern slope into another valley, which also must have been an old lake-bottom, to the little town of San Felipe, where we had a good supper and rooms.

The next day was Sunday. We would have liked to spend this day at San Luis Potosí, but the diligences all ran on Sunday, laying over on Monday. The diligence this morning was crowded inside with three girls in their teens accompanied by an old *mozo*, who carried a guitar in one hand and a bottle of aguardiente or whiskey in the other. He drew upon the resources of the latter more frequently than the former, with the result that he soon got so inconveniently drunk that he could not sit up straight. On the other hand, the girls indulged in smoking cigarettes. At eight o'clock we stopped at a

forlorn Indian village, directly in front of a small church, over the portals of which was inscribed: *Mi Casa es Casa de Oracion*.—Mat., c. 21. It was the hour of morning service; the church was filled with the kneeling throng of worshippers, so also the church-yard and the street in front nearly out to where our diligence had stopped. The market-place was not, however, entirely deserted, a few women, each sitting by a heap of oranges and vegetables, awaiting a possible customer.

We dined at the town of Dolores, the birthplace of the patriot Hidalgo. A conspicuous inscription had been placed over the house in which he was born. His memory is held sacred by the Mexican people. It will be remembered that Hidalgo, with Morelos, a brother curate, rebelled against the Spanish rule; after an heroic struggle the insurgents were defeated, and Hidalgo was executed at Chihuahua in 1811. The small plaza in Dolores is well-shaded with tropical trees and flowers, and the seats and walks were thickly crowded, as it was Sunday noon.

At four o'clock, after a hot and dusty ride, we reached San Miguel, the most picturesque and foreign-looking town we had yet seen. It is situated on the side of a high hill, at the base of low but picturesque mountains, and the streets are steep and narrow. The plaza is small, but overgrown with beautiful flowers, and facing it was a very tasteful modern church of red freestone, with two handsome bell-towers. The hotel was two-storied, the courtyard adorned with dark cypresses, and the chambers well furnished.

We had now arrived at the end of our week's ride in Mexican diligences. We had dreaded the dust, heat, and fatigue of the journey, had made up our minds for a meet-

ing with *ladrones*, and expected to suffer from the country diet. But the meals and country inns were better, on the whole, than we expected; the beds free from insect pests, whether scorpions, centipedes, or fleas; and the clear, bracing air of the elevated plateau, with its old lake basins and serrated ranges, enabled us to withstand the fatigue resulting from the early rising, the dust, and the heat and jolting. The service was prompt; the diligence, never crowded, always started and arrived on time; there were no break-downs; the drivers were skilful, faithful, and, so far as we knew, honest; we were not imposed upon by the landlords (except at Saltillo, at the meson of San Stefano), and the road-agents, if there were any, gave us the go-by.

We now were to exchange the leisurely, old-time diligence for noisy, jerky, cinder-breeding, ill-ventilated, narrow-gauge railway cars. Rising between three and four in the morning, we drove a couple of miles out of town in a hack, taking the train at 5:15. The ride to the city of Mexico, which we reached at half after seven in the evening, was full of interest and novelty. After passing through a narrow cañon, whose precipitous walls were richly dressed in tropical green, we passed through an agricultural country. The men were going to their work in the field with oxen drawing an archaic plow. The heavy yoke is clumsily tied to the horns, and in this barbarous fashion, with their heads meekly bowed down, they drag a long pole, with a short branch at the larger end forming the plowshare. A modern plow was not seen in Mexico, though they are probably used near the borders of New Mexico. Near Celaya are several extinct volcanoes, the rich, black soil formed of the crumbling

lava. The train stops at the interesting Indian towns of Acámbaro and Maravatío, where crowds of people swarm about the stations. We then enter the famous Lerma valley, our train hurrying over the fertile plains, where are pastured enormous droves of cattle and sheep. Then we rush through the beautiful *cañon de los Zopilotes*, or "the cañon of the turkey buzzard." Between Tultenango and Flor de Maria are wild-looking, extinct, conical volcanoes, from which ancient lava streams course down into the valleys, while at the station of Ixtlahuaca, at half-past three in the afternoon, we get a fine but distant view of the magnificent, snow-clad volcano, *Nevado de Toluca*, which rises 15,156 feet above the sea, and about 9,000 feet above the city of Toluca. Beyond Toluca we go over the Lerma pass, rising to a height of nearly 10,000 feet, through a cañon whose wonderful scenery is scarcely inferior to that of the Mexican railway near Orizaba. The train rises through rows of oaks and pines from the *tierra templada* into the *tierra fria*, where are forests of a long-leaved pitch pine and white pines, and above them a growth of tall spruce; while at the summit of the pass or divide, at Cima, at an elevation of 9,974 feet, are bare alps, hills of rich volcanic mud covered with a short grass. The descent into the valley of Mexico was inconceivably fine, and the sunset was magnificent, the afterglows of red and purple yielding to the mantling shades of night as our train ran into the city limits of the Mexican capital.

GEOGRAPHICAL NOTES.

THE DISTRIBUTION OF HEAT.—In the Memoirs of the Vienna Imperial Academy of Sciences, vol. li., 1885, Herr Spitaler has an interesting paper with carefully prepared tables on the distribution of heat on the earth's surface. The first of these tables gives the mean temperature, Centigrade, of the year for every fifth parallel of latitude from the equator to 90° North and South; the figures for the very high latitudes being, of course, merely speculative, since actual observations are wanting:

Latitude.	N.	S.	Latitude.	N.	S.
0	25.9	25.9	50	5.6	5.9
5	26.1	25.5	55	2.3	3.2
10	26.4	25.0	60	— 0.8	0.2
15	26.3	24.2	65	— 4.3	—
20	25.6	22.7	70	— 9.9	— 4.9
25	23.7	20.9	75	— 13.3	—
30	20.3	18.5	80	— 16.5	— 8.4
35	17.1	15.2	85° wanting	—	—
40	14.0	11.8	90	— 20.0	— 9.3
45	9.6	8.9			

From the equator to the 45th parallel the northern hemisphere is the warmer, from the 45th to the pole the southern. The greatest heat is not on the equator, but at 10° N. Lat. The diminution of heat from the equator to the poles is at first gradual, then rapid, and again gradual, the greatest loss being between 40° and 45° N., and 35° and 40° S.

The second table gives the mean temperature of the year for the whole earth at 15°, and the average for January and July, as follows :

	January.	July.
For the whole Earth	12.8	17.4
For the Northern Hemisphere	7.97	22.54
For the Southern Hemisphere	17.54	12.35

According to this the temperature of the whole earth is 5° lower in January than in July, and the Earth-winter and Earth-summer coincide with the winter and the summer of the northern hemisphere.

Herr Spitaler extends his observations to the difference between the east and the west. He divides the globe through the meridians of 80° W. and 100° E. from Greenwich, so that the eastern half is mostly land, and the western half mostly water.

The mean temperatures for these hemispheres are :

	E. Hemisphere.	W. Hemisphere.
North of the Equator	16.7	13.9
South of the Equator	14.3	14.9
For the whole Hemisphere	15.5	14.4

Taking only the northern portion of these hemispheres, the January and July temperatures are found to be :

	E. Hemisphere.	W. Hemisphere.
January	9.4	6.5
July	22.6	21.3

THE SUBMARINE CONGO.—Senhor E. de Vasconcellos writes to the Lisbon Geographical Society :

“According to a communication sent me by Capt. Thomson, of the *Buccaneer*, a steamer employed in laying the submarine telegraphic cable between Bissau and Bolama, the soundings at the mouth of the Congo show

that the channel of the river is prolonged on the bed of the ocean for 300 miles. This channel is produced, not by the increasing action of the current, but by means of the detritus brought down in suspension and deposited at the sides of the stream, so that this vast river has made for itself, under the sea, two sloping banks, composed principally of coprolite mud, and pours its stream between these on the original ocean-bottom."

Soundings showed that from the tops of these banks to the surface the water was but 180 metres deep, while in the central channel, and in the sea outside, the depth was 1,820 metres. There is evidently in process of formation an immense delta, which extends in a N. W. direction from the Congo mouth, as if to meet the advancing delta of the Niger; and it is easy to foresee that, at some future remote period, the corner of the Gulf of Guinea, with its islands, will be enclosed and filled up by these colossal dikes.

Neither Capt. Thomson nor Senhor Vasconcellos explains why the Congo seems to prefer coprolites (*vasa coprolithe*) to ammonites or trilobites, or ordinary mud.

THE BANKS OF NEWFOUNDLAND.—M. J. Thoulet, in a communication to the Paris Geographical Society, describes some of the observations made during the cruise of the frigate *La Clorinde* on the southern coast of Newfoundland.

Maury's theory that the Banks owed their formation to the deposit of mineral matter brought down from Greenland by the icebergs, and released when these melted under the action of the Gulf Stream, does not find favor with M. Thoulet. It seems to him, on the con-

trary, that the icebergs have nothing to do with the Banks, which are formed, in his opinion, by erosion and the effects of cold, and by the rocks transported by coast ice from the western shore of Newfoundland and from Labrador. The character of the bed is identical with that found in the estuaries and at the mouths of many rivers.

CAN EUROPEANS BECOME ACCLIMATIZED IN TROPICAL AFRICA?—Dr. R. W. Felkin treats this question in a paper read before the British Association for the Advancement of Science at Birmingham, in the first week of September, 1886.

Dr. Felkin divides Equatorial Africa into four zones: the coast zone, extending from 50 to 300 miles inland; the zone of the terrace land, leading up to the great plateaux, and varying much in breadth; the zone of the highland plateaux; and the zone of the mountains, rising in separate groups out of the plateaux.

The coast zone is characterized by great heat, excessive humidity, and the predominance of virulent malaria.

The terrace zone has a climate which is a mean between that of the coast and that of the plateaux.

The plateau zone has a rather lower temperature, greater variation, with nights considerably cooler than the days, less humidity, and, on the whole, less virulent malaria.

The mountain zone is much cooler, and the air of it is pure and invigorating.

In Dr. Felkin's opinion, no very great importance is to be attached to the experience of travellers in Africa, as to the effect of the climate on their health. The traveller undergoes bodily exertion, exposure, and mental worry, which would affect his health unfavorably even at home.

The conclusion reached is, that northern Europeans will never be able to colonize on the coast regions of tropical Africa, or for some distance up the great rivers. All that will be possible for Europeans is to accommodate themselves for a few years to the climate, rigidly adapting their habits of life to their new environment, and retreating frequently to a sanatorium (sanitarium ?) on the higher land of the interior, or going on a voyage home or to the Cape.

Dr. Felkin believes that, with attention to climatic conditions and the common laws of hygiene, colonists of the English and German races might thrive in the districts around Mts. Kilimanjaro and Kenia, the Niam-Niam, the region north of the Albert Nyanza, the Shuli district, the country about the Lakes Victoria, Tanganika, and Nyassa, the Central Congo Free State, the Cameroons, and, possibly, the district inland from Sierra Leone.

Mr. Capper, in the discussion which followed the reading of the paper, maintained that it was quite possible for Europeans to become acclimatized, even on the west coast of Africa; while Mr. Joseph Thomson, the explorer, doubted whether the European constitution would be able to endure the climate of Central Africa.

CENTRAL AMERICA AND THE PANAMA CANAL.—In the *Revue Coloniale Internationale*, for September and October, 1886, Dr. H. Polakowsky reviews the history of the efforts at the construction of a canal between the Atlantic and Pacific Oceans, and comes to the conclusion that M. de Lesseps has chosen the only desirable and truly practical route—that from Colon to Panama.

Dr. Polakowsky admits that there has been some un-

necessary waste of money in the prosecution of M. de Lesseps' enterprise, but he believes that the canal can be finished at a total cost of 1,500,000,000 francs, or, at most, of 1,800,000,000, and will pay at once a dividend of not less than 6 per cent. These are matters which, however interesting in themselves, principally concern the stockholders of the Panama Interoceanic Canal Company; but some parts of Dr. Polakowsky's article are addressed to the general public.

He says that after the decision of the Paris Congress of 1879, in favor of the Panama route, a great portion of the American press used threatening language about the Monroe Doctrine, with which the contemplated canal had nothing to do, and magnified the advantages of the Nicaragua line. In 1880, Engineer Menocal, on behalf of a provisional company in New York ("headed by ex-President Grant, a reckless projector and speculator"), concluded with the government of Nicaragua an advantageous contract for a canal through that country. This contract was declared null and void in October, 1884, because the canny Yankees, who were willing enough to write and to agitate against the "French" canal by Panama, were much too shrewd to risk any of their own money in the Nicaragua enterprise, for which they had hoped, but failed, to secure the aid of foreign capital.

Dr. Polakowsky's conclusion with regard to the Monroe Doctrine is, perhaps, a little hasty, and he will hardly take it amiss if the American people prefer to do their own thinking on that subject.

It is quite true, as he says, that the Company of 1880 did not begin the cutting of the Nicaragua Canal; but, ac-

according to his own account, this lapse seems to have been due much more to the close-fistedness of the Europeans than to the exceeding shrewdness of the Yankees. It was, in truth, due to neither of these, but to the slowness with which the general mind everywhere receives the idea of a great enterprise; and it is not to Dr. Polakowsky's credit that he has overlooked this constant quantity in his study of the Interoceanic Canal problem, now three centuries old.

If he is less than courteous to the Americans, Dr. Polakowsky treats recorded facts with something very like disdain.

The Nicaragua Canal, he says, is to be not less than 294 kilometres long (182.6769 miles); but Mr. Menocal, acknowledged by Dr. Polakowsky himself to be an engineer of consummate ability, gives to the canal a total length of 169.8 miles. Engineer Menocal provides for 7 locks; Dr. Polakowsky asserts that 14, at the very least, and probably 20, will be necessary.

Dr. Polakowsky tells us of 5 great dams to be built, where Engineer Menocal designs but one, and of solid embankments, 37 kilometres in length, to defend the Nicaragua Canal against the effect of the tremendous rains; a precaution, adds this entertaining writer, *wholly uncalled for on the line of the Panama Canal!*

The time of transit by way of Panama is put at 12 hours, and that by Nicaragua at 6 days.

Engineer Menocal estimates the time required for the passage of a ship through the Nicaragua Canal, from sea to sea, at thirty hours.

THE ANGLO-TEUTON IN CALIFORNIA. — Dr. Klemens

Max Richter, of San Francisco, writes to the *Deutsche Kolonialzeitung*, of Oct. 1st, a letter full of statistics and enthusiasm concerning the Golden State. He says truly enough that the climate is healthful in every part of the State, that the soil is amazingly fertile, and produces nearly every thing that could be desired, and that while the northern boundary is near the latitude of Rome, San Diego, at the southern end, is almost on a line with Jerusalem. No harm is done by repeating these well-known facts; but a doctor who adds to his name the qualification of "Königl. Stabsarzt a D.," and appears to have resided in California for a number of years, ought to have an approximate idea of the size of the State. With the correct figures before him in the Census Report, he prefers to tell his readers the old, familiar story, a thousand times repeated and a thousand times disproved, that California contains 188,981 square miles; 33,000 more than it has.

The population of the State in 1880 was 864,694. Of these 571,820 were natives of the United States, 33,097 natives of Great Britain, 62,962 from Ireland, 42,532 from Germany, 73,548 from China, and the rest from various other places.

It is, without doubt, the study of these numbers which leads Dr. Richter to conclude, with a distinguished climatologist whom he quotes, that California is destined to produce, in the "Anglo-Teuton," the highest possible development of the human race. No conclusion could be more pleasing to those fortunate persons who happen to be Angles or Teutons; but to the rest of mankind it must look as if Dr. Richter were any thing but a Daniel come to judgment.

COMMUNICATION BETWEEN THE DANUBE AND THE RHINE.—Dr. Joseph Szabó describes, in the *Bulletin* of the Hungarian Geographical Society, the discovery in 1877 of subterranean passages through which the waters of the upper Danube flow into the little river Aach, and thence into the Rhine. The discovery was brought about by remarking that dams, constructed for the purpose of accumulating the water for the use of factories established on the Danube, did not produce the desired result. Examination showed several rifts in the white jurassic rocks of the river bank between the villages of Immenlingen and Möhringen; and it was found that at these points as well as at Tuttlingen, a village higher up the river, the Danube often ran dry. The level of the Aach is more than 500 feet below that of the Danube, and this difference of level suggested the experiments which explained the mystery. A large quantity of creosote was introduced into one of the fissures through a rubber tube more than a hundred and fifty feet long. This was done at four o'clock in the afternoon of the 22d of September, and on the 25th, at six o'clock in the morning, the water on the other side of the dividing ridge showed the presence of creosote.

Another experiment was made on the 24th of September. Two hundred hundredweight of rock salt were thrown into the Danube, and the water collected on the other side and analyzed accounted for nearly the whole of this quantity.

In order to make the demonstration clear to the eye as well, Mr. Ten Brink, owner of a factory on the Aach, poured into the fissure on the Danube side 22 lbs. of fluoresceine dissolved in water. Sixty hours later the splen-

did green coloring was seen at the source of the Aach; and it remained visible for thirty-six hours.

The experiments proved, in Dr. Szabó's opinion, that there is a direct connection between the Aach and the Danube; that when the Danube is low, it furnishes half the water of the Aach; that the connection between the two streams is by fissures in the white jurassic rocks, which are about 1,000 feet thick; that as the system of fissures is in the strata which extend in the form of a trough between the Rauh-Alps and the Randen, it is to be supposed that the fissures widen farther down, and that the water descends to the strata of marl and clay, which form the base of the calcareous rocks, and that after flowing a distance of 11 kilometres it issues in the lake which is the source of the Aach; and that the banks of the Danube between Immendingen, Möhringen, and Tuttlingen are not so well adapted to the employment of water-power as the region of the Aach, since it is easy to predict, from a geological point of view, that the openings which absorb the waters of the Danube will become greater and greater in course of time, and will draw off, to the advantage of the Aach, a constantly increasing volume of water.

In conclusion it must be admitted that, geographically speaking, the Danube does not belong exclusively to the basin of the Black Sea, but that it is, in the upper part of its course, a secret tributary of the North Sea, and that there are times when it belongs wholly to this alone.

At the time of his visit (Aug. 17, 1883) Dr. Szabó crossed to the right bank of the Danube, where one of the clefts in the rock was hidden by bushes, and heard very distinctly the sound of the waters pouring into the invisible gorge.

EXPLORATION OF THE RUINS OF COPAN.--In the *Proceedings* of the Royal Geographical Society, for September, Mr. A. P. Maudslay gives an account of two expeditions to Central America, made by him in 1883 and 1884, for the purpose of exploring the ruins at Quirigua and Copan. At Quirigua a careful survey of the site was made, and more than a thousand moulds in plaster and paper were secured and safely transported to the Archaeological Museum at Cambridge.

At Copan the work was more serious. The ruins here are much more extensive, and Mr. Maudslay was interrupted in his labors, at one time by the war, in the course of which Barrios was killed, and at another by the prevalence of small-pox in the neighborhood. He persisted, however, and added to his collections, now safe in London.

Mr. Maudslay is satisfied that all these Central American cities, Copan, Quirigua, Palenque, Tikal, and Menché, must have been abandoned before the discovery of America; and his exploration convinced him that many of the statements as to the character of the ruins had been made in error. The long heaps of stones which have been taken for ruined city walls are, in fact, the remains of single-chambered, stone-roofed houses, probably dwellings, raised on foundations not more than two or three feet high.

Numbers of such houses are to be found in all parts of the valley of Copan.

The whole mass of terraces and pyramidal foundations for the temples is built up of a rubble of blocks of stone and mud, bound together with internal upright walls of faced stone and horizontal layers of cement. The worked stone casing was usually arranged in great steps, a single

step sometimes measuring eight feet in breadth and height. The rains and the vigorous vegetation have broken down these structures into rough mounds.

On digging into these mounds, Mr. Maudslay found fragments of human bones, stone axes, jade beads, pearls, and, in one place, a pot containing a red powder and several ounces of quicksilver. There were also two jaguar skeletons, one of them partially painted red, and other animal remains.

The roofing used was the horizontal arch, found in all ancient American buildings. All the stone facings, the steps, and the cornices were covered with the carvings and sculptures made familiar to the public by the drawings of Catherwood.

Mr. Maudslay's general conclusion is that the people of Central America and Yucatan, inheriting a similar civilization, represented at the time of the Spanish Conquest two different stages of decay: the former having abandoned their great structures and gone back to a lower state of culture; while the Yucatecos, though they had almost ceased to be builders, still clung to some of the wonderful edifices, which were either particularly useful, or were venerated for their sanctity.

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SOME OF THE GEOGRAPHICAL FEATURES OF SOUTHEASTERN ALASKA.

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In the summer of 1886, a party consisting of Lieut. Schwatka and myself was sent out by the *New York Times* to explore the Mt. St. Elias Alps. On our way thither we passed through the wonderful archipelago region of Northwestern America, and although much has been written concerning the beauty of the scenery, the habits of the natives, etc., a short description of some of the main geographical features of this curious portion of our continent will form a fitting prelude to the discussion of what we found that was new and interesting. I shall not attempt a description of the country with reference to its resources, capabilities, etc., for that has already been done to some extent by Prof. Dall, by the Krause brothers, by Petroff, and by Elliott; nor shall I describe the early attempts at Alaskan settlement. Those who wish a most dramatic account of the struggles of the old Russian pirates for a foothold in this new territory, will find it in the volume on Alaska in Bancroft's "History of the Pacific Coast," which book, indeed, reads like a novel, for it is the history of an unknown land. But I shall try to give in as simple a manner as possible some of the physical characters of this most interesting region—which would be visited oftener were it better known.

This western archipelago district really begins at the Juan de Fuca Straits and extends to Cross Sound at the north, almost under the shadow of Mt. Fairweather, a distance of about 1,000 miles. At either end of this region there is a remarkable body of water which deserves mention. It is no wonder that the old navigators who first visited it, admired Puget Sound. Its varied features, the combination of beautiful bays and wooded shores, with Mt. Tacoma virtually at the head of the sound, and the fine group of Olympian Mountains between it and the Pacific, all make the scenery a continual feast for the critical observer. Passing across the straits, the harbor of Victoria is reached, and here the trip on the inland passage begins, in the course of which we traverse some 12° of latitude. Strange as it may seem, the climatic differences and conditions are not so varied as might be expected, for at this point the effect of the warm ocean current of the Northern Pacific is strongly felt, and it serves to moderate the wintry character of the northern portion, and again, tempers the summer of the southern part.

These passages were very generally surveyed and grouped by that prince of the older navigators, Vancouver, about one hundred years ago, and it is to his industry and zeal that we owe much of our knowledge of this part of our country. Nearly all of them can be traversed by the largest ships, and the numberless smaller waterways, which are now only known and utilized by the Indians, will some day become the favorite resort of the canoe clubs of the Pacific coast. Many of these fjords pass inland, but the larger and more important run parallel to the coast. The most remarkable, perhaps, is

Chatham Strait, which passes over 3° of latitude, is from five to six miles broad, and has a depth of from 500 to 600 feet. To this might be added the Lynn Canal, Glacier Bay, Takoo Inlet, Boca de Quadra Straits, and, above all, the Portland Canal, through which passes the boundary between British America and Alaska, and many others, all of which have their own characteristic charms. They have been well compared to the streets and avenues of a great city, and as one travels along for days on these peaceful waters without feeling the motion of the great Pacific, which is often plainly in sight, in imagination the bustle and turmoil of the metropolis is hushed and the rest of the world almost forgotten. The thing that most reminds the traveller that he is really on an arm of the ocean, is the remarkable rise and fall of the tides, which average about twenty feet, and the strong eddies and currents which are established on either side of slack water are the only sources of danger to ships. Peril Straits, the favorite passage between Glacier Bay and Sitka, is a good example of this, as the sharp turns of the channel are very dangerous between the ebb and flood of the tide.

In searching for the causes which produced this region, one is struck with its similarity to the western coast of Norway. Here we find the same climatic conditions which are so favorable for the production of great ice masses, viz.: constant winds laden with moisture, which condenses at a slight elevation in this latitude in the shape of snow; and as the heat of summer does not succeed in melting these bodies, vast accumulations take place. To-day we find in the glaciers which gleam on the mountain sides of these channels only the relics of

their former greatness. The history of the great Muir Glacier at the head of the Glacier Bay is but the silent witness of the fact that these ice masses are rapidly receding to their mountain fastnesses, for it has retreated many miles towards its sources since it was first discovered. The traces of ice action are difficult to follow on account of the veil which has been thrown over them by the thick forests, deep moss-beds, and the serious destruction of the characteristic tool-marks of the ice through the disintegration of the rocks, brought about by the severe changes in temperature; but these traces can be found. If nothing else could be said, the shape and evenness of the beds of these channels would be convincing proofs of glacial action, for they cannot be the result of marine or fluvial erosion. There are also a sufficient number of glaciers along these channels, many of them still reaching down to the water's edge, which serve to indicate their former extent. These glaciers are all the more impressive now because they are found in the midst of the most beautiful forests, and the temperate zone seems to be in this way placed side by side with the ice fields of the arctic. As we pass around the grand wooded headlands, we cannot resist a feeling of awe catching our first glimpse of these white waves of an icy sea through the bright foliage, and when they are lighted up by the soft glows of the evening sun, the beautiful panoramas demand and receive the most unstinted praise.

Every one who visits Alaska is surprised at the luxuriance of the vegetation, a feature which is undoubtedly due to those same air currents which, under different climatic conditions, covered this lovely spot with ice. We have every step in the process of the change exempli-

fied when we contrast the bare and almost woodless slopes of Glacier Bay with the growth on the sides of the channels where the ice has been absent for a longer period of time.

With such changes and attractions spread out before the tourist at each turn in his trackless path, we cannot wonder at the glowing descriptions we read of the scenery, and the keen enjoyment that is felt by all who visit this region; are they not the grateful expressions of praise for a climate and surroundings which almost make a human being forget his cares and give himself up to their refreshing influences? One beautiful vista after another is opened up before him, and instead of being exhausted by the trip when Sitka is reached, the traveller is only better prepared to enjoy the return trip. This Bay of Sitka is a wonderful place, and some of its points of interest amply repaid investigation.

On the southern shore of Kruzoff Island, which forms one side of the quiet harbor of Sitka, the star-like peak of a justly famous mountain rears its head towards the clouds. It is a beacon which is visible a great distance at sea, and in the past no doubt it was the guiding-star of the adventurers who chose this part of Alaska as the scene of their activity. Mt. Edgecombe is remarkable for its symmetry of shape and its graceful lines of beauty; and these features, combined with a snow-cap of wonderful proportion and outlines, makes it an imposing bit of natural scenery, possessing a species of fascination of which one never tires.

From a distance it seems to be the most prominent peak of a small group of mountains; but a careful study reveals the fact that *the* great volcano of this region has

not yet been described, and the peak which has attracted most attention is merely a parasitic cone on the side of a grand old crater which has not been active for hundreds of years, while the other peaks of the group seem to be remnants of a still greater volcano whose history would carry us back to the most remote past. The mountain group reminds one strongly of Monte Somma and its successor Vesuvius, except that our northern mountain is wreathed with a glistening coronet of purest snow throughout the greater part of the year, and is considerably higher than its older crater, which is not the case with Vesuvius. This group of elevations appears to rise from a sort of plateau, which is nothing more or less than the outer surface of the overflows of the greater volcano referred to above. The peak now known as Mt. Edgecombe is situated on the southwestern portion of this main mass and reaches above it about 2,000 feet, making the total elevation of the mountain nearly 4,000 feet.

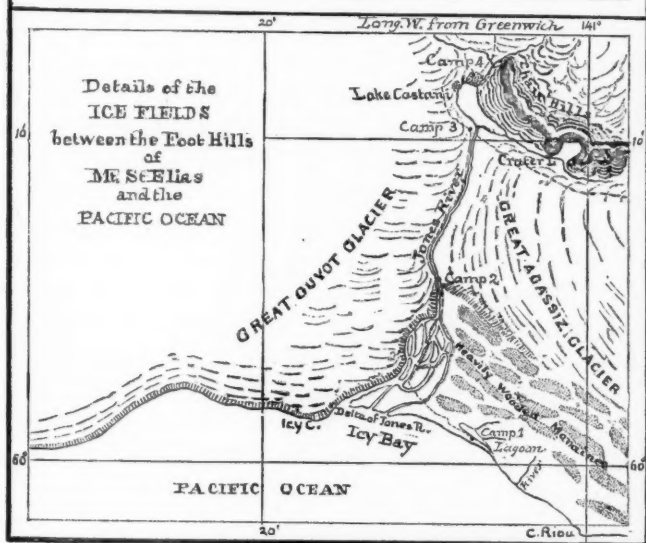
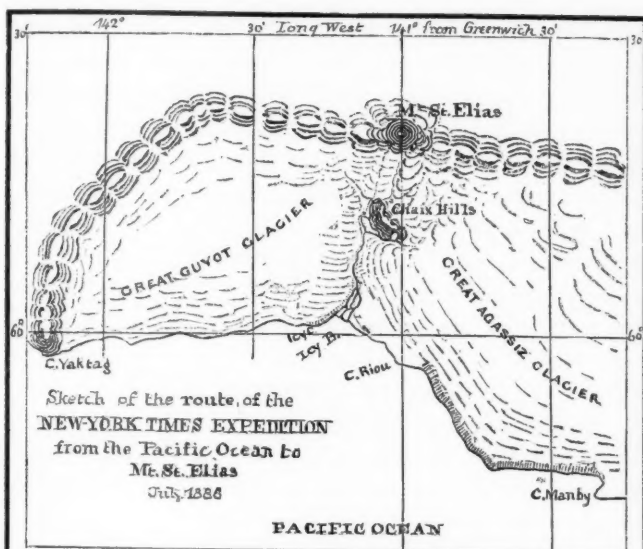
The character of each of these mountains (for they should be considered separately) is a very instructive study in physical geology, as we have here representatives of the two main forms of volcanic structure. The older and larger crater evidently was the point from which all the great lava streams flowed to form the whole lower extremity of the island. These lava streams can be distinctly seen to radiate from the old volcano in all directions, and can be traced from four to eight miles to the seashore on three sides, where the heavy black basaltic columns form the numerous capes which extend out into the ocean; in many instances strongly resembling the formation of the Giant's Causeway. In this great mass we recognize the results of volcanic operations at a

period when the lava must have been very fluid, and consequently the angle of slope, as also the elevation of the mountain, could not become very great. The period of activity in this case must have been comparatively short, probably owing to the climatic influences which may have made it impossible for a volcano representing the southern Pacific type with its long, flat slopes of from 5° to 15° to exist for any great length of time. In many respects the lower slopes resemble those of Mauna Loa, with the exception of those around the immediate crater. Just at the last of this period of activity, the eruptions, still consisting of the denser lavas, must have been of a more violent nature, and thus a higher rim was formed than is usual in such mountains. This rim is almost a perfect oval, with very steep internal slopes of about 60° , which run down perhaps 1,500 feet to the bottom of a large basin having a longitudinal diameter of about three miles and a transverse diameter of about two miles; the diameter of the outer upper edge being, of course, much larger. The floor of this large area, covering several hundred acres, clothed with a dense forest, is nearly a perfect level except in the centre, where a slight elevation, also covered with trees, reveals the results of the last struggling efforts of the giant forces which were at work in the formation of this curious district. Standing on the edge of this once busy arena, and reading the plainly written history of its structure, which was thus burned into the surface of the earth by the now slumbering powers of the past, the scene is one of surpassing beauty. This garden lying so far below one's feet and its plain covered with magnificent trees, dotted here and there with meadows and quiet lakes, which lie so peacefully in the

gentler slopes of the surface of the basin, all tend to make one believe that the old stories of enchantment were not mere myths after all, and that perhaps the strange story of Sinbad might be at least founded on facts, or that the story-teller of the Thousand and One Nights was the lucky Jules Verne of ancient times. The view of the harbor of Sitka with its numerous islands, the snow-covered crests of the mountains, to the eastward, beyond Silver Bay, and the boundless Pacific stretching out to the west are to be numbered among those impressions that nature sometimes makes upon memory's tablets, which cannot be easily forgotten.

Turning from the edge of this wonderland to the south, the steep slopes of Edgecombe lie directly before us, and here we find evidences of a different form of the struggle for existence on the part of the nearly extinct volcano. The pent-up forces which had probably lain quiet for some time succeeded in forcing an opening. This period of activity brought to the surface the lighter scoriaceous material and piled it up around the new vent, thus forming a high, steep cone, which heretofore has been the most attractive object on the island. The slopes of the sides are generally from 50° to 60° , though in some places they are less. The steepness of these slopes, as compared with the larger mountain, being due to the fact that the forces were then violently eruptive, and the material was thus heaped up in strange contrast with the more even forms of the passive eruptions which must have taken place from the other crater, and which would resemble the comparatively quiet overflow of a boiling spring as contrasted with the explosions of a geyser.

This volcano has a nearly perfect crater, which is not



very deep. The bottom of its basin can be easily reached through a break on the southeastern side. Lava flows have also occurred from this peak, as their course can be traced down its sides, and they passed over the greater lava beds produced by the older mountain.

This mountain has been extinct for about one hundred years, and its active period must have been short, otherwise it would have partially obliterated the lines of the rim of the older crater, being situated so close to it. We have reports of its having been seen in eruption by the navigators who first came in sight of it, but considerable doubt is thrown upon their accounts from the fact that other mountains described by them as being in eruption have turned out not to be volcanic at all,—the clouds resting upon their summits having been mistaken for smoke.

The climb is not a difficult one, though it is very steep in places; it can be accomplished in one day from a camp on the inner shore of the island. It will fully repay the efforts which any one will have to make to reach the summit, for the world-renowned view of the Bay of Naples, as seen from proud Vesuvius, is not more beautiful.

Leaving Sitka behind us, the party departed for our field of operations on the U. S. S. *Pinta*, kindly placed at our disposal by Secretary Whitney, and many courtesies were shown us by the officers of the little craft. The day after our departure was passed on the broad Pacific, in full sight of Mt. Fairweather. Here, for the first time, we received a foretaste of the glories of this truly Alpine region, and the next morning the sight was completed by a clear view of Mt. St. Elias from the Yakutat village,

and when we had seen the two grand ends of this great range, almost the whole series being snow-capped mountains, we were satisfied that we had seen a region that eclipsed any thing that we had ever gazed upon in Switzerland or elsewhere, both in extent and beauty.

After obtaining some Indians to act as porters, we were taken to Icy Bay, and landed through the surf, when our active work began. The *Pinta* left a whale-boat with us at this point, and in it we made our way back to Yakutat, after the return from the attempt to ascend the mountain. The remainder of this paper will be devoted to a description of the various physical features of the Mt. St. Elias group.

The western slope of this system of mountains, including many of the highest snow-clad peaks of North America, may be considered an enormous glacial basin with a mountain chain around it, forming a great curve whose convex portion lies toward the northeast. This chain of mountains reaches a climax in Mt. St. Elias and a series of other lofty peaks, many of which are as yet unnamed, and not even located on the map. Starting from the headwaters of Yakutat Bay, where the average height of the mountains cannot be above 7,000 feet, they gradually increase in elevation until the giants of the snow-capped range are reached in a distance of about 40 to 50 miles; Mt. St. Elias itself standing somewhat in advance of the rest of the range. This is a feature which is presented by many of the prominent peaks of the globe, viz.: that they do not stand directly in the main line of the upheaval but just out of the line and somewhat isolated, although there may be connecting ridges and shoulders reaching to them. After this highest

point is reached about the central portion of the curve, the elevations gradually decrease again, approaching the ocean to within a short distance, after having curved inland to a point about 20 miles from the coast. At about the centre of curvature of this basin we found a chain of sandstone hills, about 3,500 feet in elevation, which seems to be directly united with the southwestern face of Mt. St. Elias, by a low connecting shoulder. These hills we named after Prof. Paul Chaix, President of the Geneva Geographical Society. The strata of these hills have a most peculiar shade of purple color, and as the strata have different degrees of hardness, the active erosive powers of the frost and rain have given them shapes not unlike the upland prairie districts of some parts of Wyoming. The inclination of these strata is very slight, being scarcely over 10° in any portion of the whole mass which is continuous, and they can be traced from one end of it to the other, a distance of about 12 miles. This remnant, which is thus curiously placed, is undoubtedly all that is left of the old sandstone strata, which must have formed the shore of this region at some time in the past, having evidently been deposited after the great uplift of the metamorphic rocks which make up these magnificent mountain crests, and then were tilted to their present angle. This singular little range, composed of sandstone and thus peculiarly marked, is the only instance of either this formation or inclination of strata in the basin. It seems, strictly speaking, a reminder of a former state of things, for the glaciers which surround the whole of this range are covered for miles, often to a depth of several feet, with remnants of a similar nature, which must have been torn from the sides of this central

structure which divides the basin into two portions. Formerly it must have had a much greater extent parallel with the main range, but it has suffered more than any other part of the basin because of its position, which is directly across the path of the greater number and more massive glaciers that take their rise directly to the east and north. From the angles formed by this ridge and its connecting shoulder with the main range through Mt. St. Elias, proceed a large number of glaciers, moving in opposite directions, one group moving to the south, and the other toward the west. Each of these sets meets and joins the great groups of glaciers coming from the concave curves of the main range, which extend respectively from this central point to the southeast and northwest. The combined masses of ice from these many sources proceed in general at right angles to the mountain ranges at first, and then they sweep around toward one another, encircling the short sandstone range referred to above, in magnificent curves, sometimes giving a very broken appearance to the surface of the ice. This latter change in the direction of their motion being probably due to the fact that the largest number of tributary glaciers enter the main mass of these two great bodies of ice from the main range both above and below the centre of each curve respectively, thus determining the direction in which they move. The southern basin appears the larger of the two, and the ice mass which occupies it also covers the greater portion of the ground open to both masses, thus showing it to be the more aggressive and probably the more rapid in motion as well as the larger of the two. It passes along nearly to the western end of the Chaix Hills before meeting the glacier from the

other basin, although its component parts have had much farther to travel. That it should be more rapid in its motion could be explained from its southern and western exposure to the sun, and the climatic effects produced by the great warm current of the Northern Pacific, the Kuro-Siwo or Japanese current, either of which causes would easily produce an acceleration of its motion. That it is more aggressive can be easily seen from what has gone before, and from the effect produced upon the great northern body of ice. They meet in a distinctly marked line, which can be easily traced in the débris of the two sets of medio-terminal moraines which join at this point. That there is a struggle going on between these two giant masses is readily seen in the confusion of the moraines at the central portion and outer or oceanic extremity of the line of juncture, where the moraines are forced up much higher than at the inner extremity of the same line. At the extreme outer end of the line, of course, the roughness disappears somewhat, which state of things is due to the gradual recession of the ice laterally at this point in the southern portion, and the further fact that the main work has already been done (the other mass accepting the inevitable course forced upon it), causing it to move to the westward.

This westward course produces the bold northern side of Icy Bay, reaching its greatest seaward extent in Icy Cape, from which point the glacier gradually recedes to the northward. Icy Cape is thus a variable quantity, and may in some severe years extend a considerable distance out to sea, thus making quite a roadstead of Icy Bay, which character entirely disappears in other years when the ice mass recedes, and the bay then becomes a

mere curve in the shore. At the time we saw it, there was scarcely any thing which could be properly called a bay, and one would with equal justice dignify all of the great curves on our sandy eastern coast by the name, for to call it a bay would be very misleading.

Between the Chaix Hills and the great glaciers which surround them, we found two glacial rivers, whose waters form Castani Lake, named after the President of the Geographical Society of Rome, and this lake is situated near the western end of the Hills. These rivers vary considerably in the amount of water which sweeps along between the rocks on the one side and the ice on the other; both of these walls are very precipitous, the ice wall being generally 200 feet in height, and often over 400 feet. Both streams are very inaccessible from the ice, and where the edge of the water could be reached, which was only once in several miles, they proved impassable on account of the volume of the water under even the best of conditions. The highwater marks on the sides of the Chaix Hills, however, showed the possibilities of these streams. For a distance of fully seventy-five feet above the regular level of the stream, every thing in the shape of trees, brush, or grass had been swept off in the most thorough manner.

These streams, like all glacial streams, are caused partly by the melting ice and partly by pressure forcing the water from the ice, and they empty into the lake already mentioned. Lake Castani has a somewhat triangular shape, two of its borders being high icy walls, and the third being the Chaix Hills. It covers several hundred acres, and its surface is dotted with icebergs, which are being continually formed in it from the glaciers

or rushed along down the two rivers mentioned above. These icebergs float when the water is high enough, but are stranded when the water is drained off. This peculiar body of water is situated directly opposite the line in which the two great glacial masses from the south and west meet one another, and the outlet of the lake, which was named Jones River in honor of the patron of the expedition, is a sub-glacial stream flowing under this line of contact, as near as we could judge, for the roaring current could be distinctly heard thundering along beneath our feet whenever we crossed this line. The stream rushes from between the two great glaciers at the seaward extremity of this line of juncture at a rate of upwards of ten miles an hour, and finally spreads over a large area, forming a long, narrow delta, covered for the most part with stones, sand, and mud, but with here and there a wooded island. The delta is cut in every direction by torrents, varying from less than a foot in most instances, to four or five feet in depth. Of course these swift streams change their position easily, thus precluding the possibility of producing a map which would be accurate for more than a short time. The upper portion of Jones River is liable to obstruction, and the water held back until it has accumulated strength enough to force its way along; or the barrier may give way from other causes, particularly if it consists of ice, and then the increased volume of the stream obliterates most of the old channels and forms new ones, which in their turn meet with the same fate. After crossing this desolate waste for a distance of about eight miles, the various branches of the river reach the head of what is at present called Icy Bay, but what may become a series of prom-

ontories before many years if the present active deposit continues, for this indenture of the coast would almost be a straight line were it not for the extension of the great northwestern glacier out into the ocean, thus forming one side of this so-called bay.

So much for the general physical characters of this great basin to the south and west of Mt. St. Elias, the details of which we will present more minutely.

Near the eastern end of the Chaix Hills the longer of the two rivers forming Lake Castani rises from the side of the glacier from beneath a great ice arch, and passing down a very rapid slope enters a deep re-entering amphitheatre in the southern face of the ridge, forming a most lovely lake, from which the river again takes its onward course. The view of this lake, with Mt. St. Elias looming up beyond the guardian crests of the Chaix Hills, which watch over its peaceful bosom, as seen from the barren moraines after a hard walk, was most refreshing. The steep, deeply-wooded slopes surrounding this Crater lake, with here and there streams of water rising from the snow-banks on the upper portion of the Chaix Hills, and shot over the precipitous sides to break up in mist before reaching the bottom, or disappear amongst the foliage, all lighted up with the gentle rays of the setting sun, were a never-to-be-forgotten sight.

Some distance beyond this point, out on the ice several miles, and on the summit of one of the numerous ridges of débris forming the median moraines, at an elevation of 2,000 feet above the sea, a most extensive view could be had in three directions: over the great glacier to the southward between this position and the Pacific; then towards the southeast, over the immense field of ice

stretching off towards Yakutat Bay for a distance of forty miles; and then turning to the left once more, a full view was obtained of the long, gentle slope of the glaciers leading directly to the giants of the main range. Several of the peculiar physical features noticed from this point will be referred to later on. These slopes of the glacier one would naturally expect to be gentle, particularly with the existing exposure to the south, and the motion of this ice mass is undoubtedly freer than that of its companion with the western and northwestern exposure, whose motion would be probably more sluggish, and, as a consequence, produce less effect upon its bed, leaving it rougher, and the ice, particularly in its upper portions, more broken, and hence the tendency to form ice-cascades would also be greater. The slopes of the out-cropping edges seem to be gentler on the southern side than on the western side of the mountain.

The main mass of Mt. St. Elias, which can be reached by either of these adamantine roads of ice, rises in majestic whiteness above the broad fields of desolation which are covered with shreds torn from its slopes by the icy clutches of the glaciers. The mountain itself has the form of a truncated pyramid as seen from almost any direction, but particularly from the shores of Icy Bay. From this point the steep slopes of this pyramid, though apparently not inaccessible, terminate in a long horizontal line, which forms the two shoulders of the mountain, one of which extends to the northwest and the other to the southeast. About the centre of this horizontal line, as viewed from the south, rises another pyramid of rocks, completely veiled in purest snow, which probably has a height of from 1,500 to 2,000 feet. This point forms the

highest part of this beautifully symmetrical mountain, whose total height probably does not exceed 16,000 feet, judging merely from comparison with other mountains. The heights usually assigned to it vary from 12,000 feet, as given by the older authorities, to 19,000 feet, as deduced from the trigonometrical work of our Coast Survey.

The mountain has often been referred to as an extinct volcano, and quite as often as an active one,—in fact, a sea captain reported this summer (1886) that he had seen smoke issuing from it; but there is no proof of the existence of a volcano anywhere in this particular group of mountains, in the components of the extensive moraines, which come together from all parts of the range, in the region crossed by our party, as none of the true eruptive rocks are present. In fact, the presence of the metamorphic rocks, sandstones, and slates, proves, if any thing, the reverse, and indicates that they are not of volcanic origin.

The occurrence of several almost perfect amphitheatres on the western face of the mountain will more than likely account for this delusion, as they resemble the craters of extinct volcanoes very closely, and could be mistaken for them at a distance. The moraines of glaciers which could be traced directly to these great amphitheatres were crossed, and no volcanic rocks found, thus showing that they must have had a glacial origin. This fact gives new support to the theory of the glacial origin of many other amphitheatres of the same general character in other mountain ranges. These occur notably in the Pyrenees, where many beautiful examples are found, which are called "cirques," and none of them are occupied by the snow and ice masses which undoubtedly caused them,

while here the glaciers are seen at their work carving them out of the sides of the mountains.

The whole region is very instructive as a geological study, and it is also interesting from a physical standpoint, as it gives us a clue to the formation of all the land lying between the foothills and the ocean. Most of the shores on both sides of Yakutat Bay are composed of a series of ridges of slight elevation, built up of glacial drift, left by the receding sides of the great ice mass which must have covered them at some time in the past. The ridges are heavily wooded in most instances, and this is especially true of the southern shores of the bays on this coast; on the northern shores, after a single ridge, in most cases, is passed, only the bare moraines are found; very often, however, these bare moraines touch the ocean directly, and in some instances the ice itself breaks through and forms the only shore line.

The southern shore of Icy Bay is wooded with spruce, and this belt of vegetation is very narrow, being confined to the ridges near the beach. These woods gradually disappear as the glacier is approached, and a low stunted growth of bushes, mostly of the laurel type, takes its place, and even these get to be sparsely scattered, and then die away entirely, leaving nothing but the bare stone heaps of the moraines. These masses of rock are so deep that they form a complete protection to the ice below them, and therefore it melts more slowly than the exposed portions of the ice in the upper portions of the glacier. This probably accounts for the long gentle incline of the lower portions of each of these glaciers.

When viewed from the point spoken of above, to the south of Crater Lake, the bands of exposed ice, represent-

ing the separate components of the main glaciers, become narrow very rapidly, and all of the long, white, ribbon-shaped points disappear beneath the accumulating masses of the median moraines, which are thus brought closely together, long before the end of the main glacier is reached. This fact explains the longitudinal and parallel arrangement of these moraines near the coast, and also the similar arrangement across the glacier where we passed over it. These moraines have a considerable height on the glacier proper, ranging from 50 to 350 feet, and where the ice has fully melted, of course these parallel accumulations of lines of *débris* occur as we find them on the coast. The presence of this series of ridges makes travelling across the glacier exceedingly difficult.

We have named the glacier occupying the main basin to the west, the Guyot Glacier, after Prof. Arnold Guyot, late Professor of Physical Geography in Princeton College; and that occupying the southern basin, the Agassiz Glacier, after the late Prof. Louis Agassiz of Harvard College. A portion of this latter glacier has already been named the Malespina Glacier, but as the name applies only to that part which lies along the northern shores of Yakutat Bay, and only accompanies the main mass as far as Point Manby, where it ends, it is believed that both names should hold good.

The impressiveness of the Mt. St. Elias group arises partly from the proportions of the mountain itself, which are very striking; and partly from the fact that the group is situated so close to the water's edge that their full height can measurably be taken in at a glance, which is not the case where mountains rise from a plateau as they generally do. The view of this grand mountain obtained from

Icy Bay was one with which even the wildest mountain enthusiast would be fully satisfied.

Here the main portion of the extreme northwest belonging to the United States begins and the small strip which lies along the coast-line ends; and though this spot is some 250 miles beyond the great archipelago tract, and is therefore beyond the reach of travellers generally, who may have to content themselves with only such occasional glimpses of this truly grand portion of the "Switzerland of America" as they may get by peeping between the clouds of Glacier Bay at the distant summit of Mt. Fairweather, it is nevertheless hoped that ours will not be the last trip to this glorious portion of our country.

THE ORIGIN OF THE NAME "AMERICA."

BY

GEO. C. HURLBUT.

Amerigo Vespucci made two or, as some have maintained, four voyages to the New World. He wrote observations on latitude and longitude and accounts of his voyages, and drew or corrected charts. None of these works exist. Some letters of his to two friends are extant, and in these he gives notes of his voyages and of the strange people he had seen. Two of these letters were published during his life, but neither in these nor in any other known writing of his does he give his name to the land he visited and described.

The name "America" appears for the first time in the *Cosmographiæ Introductio* of Waldseemüller, or Waltzemüller (Hylacomylus), of St. Dié, in the Vosges. In this book, published in 1507, Waltzemüller says again and again that he gives the name *America* to the New World, because it was discovered by Americus Vesputius.

The first passage, on the verso of the third leaf, says:

"After which any one will more easily understand the description of the whole world given by Ptolemy, afterwards amplified by others, and lately more largely set forth by Americus Vesputius."

The next, on the verso of the ninth leaf, reads:

"The Ceylonese, the Ethiopians, and the greatest part of the still unknown land, lately discovered by Americus Vesputius. Concerning this there are subjoined the accounts of his four voyages, translated from the Italian tongue into French and from French into Latin."

On the third leaf occurs the passage :

" Towards the Antarctic Pole are situated the recently discovered farthest part of Africa, and Zanzibar, the islands of the Lesser Java and Seula, and the fourth part of the world, which may be called Amerige—that is, the land of Americus, or America, because it was discovered by Americus."

On the verso of the fifteenth leaf is the well-known statement :

" And now these parts (Europe, Africa, and Asia) have been more fully described, and another fourth part has been discovered by Americus Vesputius (as will be learned farther on), and I do not see how any one can with reason object to calling this Amerige—that is, the land of Americus, or America, after its discoverer Americus, a man of excellent parts ; since both Europe and Asia happened to get their names from women."

" The situation of this part and the manners of its people will be clearly understood from the account of the four voyages of Americus, which follows."

On the 19th leaf Waltzemüller explains why he had occasionally preferred in his *Cosmographia* the authority of the marine charts to that of Ptolemy :

" And we have so arranged matters that we have copied Ptolemy in the map, except for the new regions and some other places, while in the globe which accompanies the map we have relied upon the following description of Americus."

Four editions of the *Cosmographia* were brought out at St. Dié in the year 1507 ; two, one in Latin and one in German, appeared at Strasburg in 1509 ; and the last of all was published at Lyons in 1517 or 1518.

All but the last were published by Waltzemüller himself. It does not appear when he became aware of his error with regard to the discoverer of the New World ; but in the Second Part of the Ptolemy of 1513, printed at Strasburg by J. Schott, and very largely the work of Waltzemüller, is a line which assigns the discovery to the " former Admiral of the Most Serene King Ferdinand of Portugal."

Vespucci, who died in 1512, never bore the title of Admiral, and the King of Portugal was Emanuel the Great. The admiral alluded to could be no other than Columbus, and the legend on the New World in the map given in this Ptolemy, under the name "Tabula Terre nove," puts this question at rest.

"Hec terra cum adjacentibus insulis inventa est per Columbum januensem ex mandato regis Castelle."

"This land, with the adjacent islands, was discovered by the Genoese Columbus, in the service of the King of Castile."

Varnhagen has shown how generally the name of America, bestowed upon the New World by Waltzemüller, was accepted. In the *Globus Mundi*, brought out at Strasburg in 1509, in Latin and in German, the name is adopted naturally enough, since Waltzemüller undoubtedly aided in the production of this work; but it appears also in the *Luculentissima quædam terræ totius descriptio*, published by Johann Schöner at Nuremberg in 1515, "cum globis cosmographicis," and is there explained almost in the words of Waltzemüller:

"America sive Amerigen (sic) novus mundus: et quarta orbis pars, dicta ab ejus inventore Americo Vesputio viro sagacis ingenii: qui eam reperit Anno domini 1497."

"America, or Amerige, the new world and fourth part of the globe, so called from its discoverer Americus Vesputius, a man of excellent parts, who found it in the year of our Lord 1497."

On Schöner's globe of the year 1515 the name *America* is given to South America only; while beyond the strait to the south of it is a great land which bears the name *Brasilie Regio*.

In the folio edition of Pomponius Mela, published at Vienna in 1518, is a letter addressed by Vadianus (Joachim

de Watt) to Rudolph Agricola. In this letter America is twice mentioned. The first passage reads :

"Americam a Vesputio repertam."

The second does not name Vesputius :

"Immensum Pelagus interesse inter extremum ab America occidens et oriens Ptolomei etc."

In 1520 Apianus brought out at Vienna a mapamundi, to accompany an edition of Solinus, and in this the New World is called America. In the same year Dr. Margallo published at Salamanca a *Phisices Compendium*, and described the divisions of the earth as follows :

"Prima est Asia secunda Africa et tertia Europa . . . addenda tamen veteribus incognita America a Vesputio inventa que occidentem versus etc."

"The first is Asia, the second Africa, and the third Europe . . . and to these must be added the part unknown to the ancients, America, discovered by Vesputius, which, towards the west, etc."

It was also in 1520 that Schöner inscribed the name in the globe, which he sent in 1523 to the Canon of Bamberg, Reymer von Streytpergk.

In Phrisius' map in the Ptolemy of 1522 the name appears in its place.

In the *Cosmographicus Liber* of Apianus, published at Landshut in 1524, the name America occurs several times, and the description of the New World begins with the words :

"America ; quæ nunc Quarta pars terræ, dicitur ab Americo Vespuccio eiusde' inne' tore (sic) nomen sortita est Et non immerito."

"America, which is now called the fourth part of the world, received its name from its discoverer, Americus Vespuccius, and not undeservedly."

Henr. Glareanus Loritus, professor of geography at Basle, published a treatise—*De Geographia liber unus*—in 1527, in which he gives the name as one generally known :

"Porro ad occidentem terra est quam Americā vocant, longitudine octoginta fermē graduum, duæ insulæ Spagnolla et Isabella : quæ quidem regiones, secundum littora, ab Hispanis lustratæ sunt, Columbo Genuensi et Americo Vesputio ejus navigationis ducibus."

"Then to the west is the land which they call America, nearly eighty degrees in length (and) the two islands Hispaniola and Isabella : and these regions, so far as regards the shores, have been explored by the Spaniards, sailing under the command of the Genoese Columbus and Americus Vesputius."

Glareanus' book was adopted as a text-book in the schools, and Varnhagen affirms that he has seen editions bearing the dates 1528, 1530, 1533, 1534, 1538, 1539, 1543, 1551, and others still later.

The *Cosmographicus Liber* of Apianus was reprinted no less than eleven times between 1524 and 1574, without counting the translations. Apianus brought out, also (at least, the work is ascribed to him), a compendium of the *Cosmographice Introductio*, under the same name, and repeating the assertion that Vesputius had discovered the New World, and that the name *America* was given to it for this reason.

Of this little book Varnhagen has personally examined four editions, one of Ingolstadt, two of Venice, and one of Paris ; and he notes in the catalogue of the public library of Padua two other editions which he has not seen, both of Venice.

Gemma Frisius, who annotated and added to the work of Apianus, published at Antwerp in 1530 a work on the principles of astronomy and cosmography, of which there were several later editions, besides a French translation, published in 1556. In all these the New World is called *America*.

Schöner's *Opusculum Geographicum* (Nuremberg, 1533) gives the name of *America* to the newly discovered regions of the west.

The various editions of Ptolemy contributed to fix the name in the public mind ; and among the epitomes and compilations of geographical works there is one, published at Venice in 1537, which has among its cuts an engraving of the two hemispheres, the western one with the inscription, *America*, while on the back of the frontispiece is an engraving in which the name is curiously misspelled, *Ametrica*.

Mercator's globe of 1541, reproduced in fac-simile in 1875 by the Belgian War Department, divides the land surface of the world into five parts—Europe, Asia, Africa, America, and the Land of Magellan, lately discovered. On this globe Europe, Asia, and Africa are copied from the maps of Ptolemy, while the names, especially those of the far Eastern countries, appear to be taken from Marco Polo.

The name of America is written on the whole Western Continent, *Ame-* on North America and *-rica* on South America. Below it are the words: *A multis hodie Nova India dicta*: "Called to-day by many, New India."

The Land of Magellan is made of great extent, and covers all the region around the South Pole, the geographers of the time reasoning that, without a vast southern continent to balance the mass of land in the northern hemisphere, the equilibrium of the world would be destroyed.

Sebastian Munster, whose *Cosmographia* was so long and so widely recognized as authoritative, adopted the name *America* in the *Novus Orbis* of Grynæus, which he brought out in 1532, and it appears in the numerous editions of his own book in Latin, French, English, Bohemian, and other tongues, from the first in 1544 to that of 1598.

In Honter's *Rudimenta Cosmographica*, the map of the New World bears the inscription: *America*.

A little work, published by Jacques Focard at Lyons in 1546, under the title: "Paraphrase de l'Astrolabe," after giving a description of the three parts of the world known to the ancients, adds that besides these there had been discovered no land which could be called a continent, "*excepté une appelée Amérique, de laquelle ne sommes encore bien assurés*"; and then proceeds to give a description of this, so far as known.

This record, which could be lengthened, shows that the name suggested by Waltzemüller in 1507 had become, in fifty years, the recognized name of the Western Continent, except in Spain, where the official designation of "The Indies" held its ground.

It was for a long time an effective commonplace to denounce Vespucci's usurpation of the glory which rightfully belonged to Columbus; but his innocence in the matter is now so clearly established that even the school-books are beginning to state the case with fairness.

When one door is shut, however, another is opened; and in history the last word is never spoken.

Waltzemüller's declaration as to the origin of the name *America* seems to be final; but it has been called in question, and the whole subject has been reopened in these later years.

Mr. Jules Marcou, a distinguished American geologist, published, in 1875, two articles—one in English in the *Atlantic Monthly*, the other in French in the *Bulletin* of the Paris Geographical Society, and made in these an ingenious argument in favor of the American origin of the name *America*. Briefly stated, his argument is to this effect:

There exists between Juigalpa and Libertad in the province of Chontales in Nicaragua, a highland region or chain of mountains, known by the name of Amerrique, Amerique, or Americ. This chain stretches on one side into the country of the Carca Indians, and, on the other, into that of the Rama tribe. The Mico, Artigua, and Carca rivers, which unite to form the Blewfields, and the Grande Matagalpa, the Rama, and the Indio, all flow from these mountains into the Atlantic; and, on the other side, the Comoapa, Mayales, Acoyapa, Ajocuapa, Oyale, and Terpenaguatapa flow from these same mountains of Amerrique into the Lake of Nicaragua.

Columbus, on his fourth and last voyage, reached, on the Mosquito Coast, the river to which he gave the name of Rio del Desastre. This, Mr. Marcou identifies with the Grande Matagalpa. Some days after, Columbus stopped for a time at a place named Cariay, in order to repair his ships and rest the crews. While there he inquired about gold, and learned that the metal abounded in several places which were named to him. The last of these was Veragua, twenty-five leagues farther up the coast. This place is on the great bay of Chiriquí in Costa Rica. Twenty-five leagues beyond Veragua was Carambaru, a little north of the river San Juan and the present Greytown. Cariay must have been more to the north, in the neighborhood of the mouth of the river Blewfields. This region is now inhabited by the Carca Indians, and Carambaru must have been near the Rama river in the country of the Ramas.

The Amerique chain of mountains runs through this region, and there are gold mines in it which are now worked. Columbus, in the letter which recounts this voyage, while

he says he was told of places rich in gold, contents himself with naming only the province of Ciamba; yet it seems to Mr. Marcou most probable that the Indians often spoke of *Amerique*, or *Americ*, and he holds it to be almost certain that they answered the continual question, as to the source from which the gold was derived, by saying that it came from *Americ*.

When the Spaniards returned to Europe they probably boasted of having discovered mines of gold, meaning, of course those reported as existing in the region of *Amerique*, and this strange name, repeated from mouth to mouth, travelled through the cities and towns and villages of Spain, and beyond the Pyrenees, until, at last, it reached Waltzemüller at St. Dié. He, not knowing the significance of the word, supposed it to be derived from the name of Albericus Vespucius, whose account of the New World was the only one with which Waltzemüller was as yet acquainted. "To support this derivation," says Mr. Marcou, "it was necessary to twist the name of Vespucius into the form *Americus*, and this Waltzemüller did not hesitate to do, though in calling the New World after the baptismal name of the supposed discoverer, he was violating the rule which makes this an exclusive privilege of crowned heads. If named after Vesputius, the New World ought to have been called *Vesputia*, and not *America*." The only explanation of this inconsistency is, in Mr. Marcou's opinion, the fact that Waltzemüller had heard the name *Amerique* before associating it with Vesputius.

In closing his argument, Mr. Marcou points out the advantages of his theory. These are: that it takes nothing from the glory of Columbus, because it shows that the

name of the continent is an indigenous name ; that it disposes forever of the accusations against Vesputius, the more decidedly that his name never was Americus, but Alberico, or Amerigo ; that the name America, while indigenous, admits of no confusion between the whole and a part, because it comes from a locality too insignificant to give rise to misconceptions ; and, finally, that it seems to be admirably chosen from a spot in the very centre of the continent, and to reach out thence to the north and to the south, to the West Indies and to the Pacific, from the heart of the longest line of mountains on the globe. It is well chosen, also, says Mr. Marcou in an addendum to his *finally*, because "it is very probable that it struck the ear of the great admiral Columbus on his fourth voyage, so that the illustrious discoverer of the New World was the first European who heard and pronounced the name *Amerique*, or *Americ*, although we do not possess the certainty and the material proof of this."

This theory, put forward almost simultaneously in America and in Europe, did not immediately attract attention. It is first noticed in the report of the International Congress of Americanists, held at Luxemburg in 1877. M. Schoetter read before this Congress a paper on Amerigo Vespucci, and in a note to this he makes the following comments on Mr. Marcou's theory :

"It is still to be explained how a local name, which is not to be met with in any account of the sixteenth century, could have found its way before the year 1507 to a little town buried in the Vosges mountains. Furthermore, the name of the Florentine navigator was first applied to the southern part of the continent, which was then believed to be an island situated to the south of the West Indies."

In *Ausland*, No. 21, for 1881, Mr. Marcou's objection to the form *Americus* for Vespucci's name is noticed,

with the brief remark: "It must not be overlooked that the orthography of proper names was dealt with in an arbitrary fashion in those days, and that there is no very great difference between Alberico and Amerigo, Albericus and Americus."

In 1883 a translation, somewhat condensed, of Mr. Marcou's French article appeared in the *Boletín* of the Geographical Society of Madrid, and a summary of its argument was brought out in the *Bulletin* of the Société de Géographie, of Toulouse, for December.

It was early in the same year that Mr. T. H. Lambert read before the American Geographical Society a paper under the title: "The Origin of the Name *America* from the National History of the Peruvians." This paper, written apparently without knowledge of Mr. Marcou's ingenious theory, leaves the impression of having been suggested by it.

The Argentine Geographical Institute republished, without comment, in the third number of its *Boletín* for 1884, the translation of Mr. Marcou's article made for the Madrid Geographical Society.

It is in the *Deutsche Rundschau für Geographie und Statistik*, for August, 1885, that the next notice of Mr. Marcou's theory is found, in a short article by Dr. K. Würzburger, who remarks that the appearance of Ortelius' great Atlas in 1570 definitely established *America* as the name by which the New World was to be known in Germany, but expresses no opinion concerning the new theory.

Prof. Guido Cora was the next writer to take up the subject, in an article on "The Precursors of Columbus in America," in the *Bollettino* of the Italian Geographical

Society for December, 1885. Prof. Cora contents himself with stating briefly the substance of Mr. Marcou's paper, and noticing Mr. Lambert's by the way; and he adds that the case is not to be hastily disposed of, and that it seems to call for more ample information. The matter was taken up at this point by Mr. Luigi Hugues,* who has studied Mr. Marcou's theory with calmness and impartiality, and has come to the conclusion that all the evidence is against it. Mr. Marcou lays stress upon the termination *ic* or *ique* in American names, and cites, among others, with a certain emphasis, the name of *Jamaica*. Mr. Hugues reminds him that the true name of the island is, in the old Spanish orthography, Xaymaca, which differs in form and meaning from names in *ic*.

Mr. Hugues shows, by quotations from letters written to Vespucci and by his signature, that his name was Amerigo; and he answers the observation that the continent, if named after Vespucci, ought to have been called *Vespuccia*, by an appeal to Humboldt, who says: "The preference shown by Waltzemüller for the prænomen, over the family name of the Florentine navigator, is easily explained by the inferior sonorousness of the name Vespucci and its derivative Vespuccia, as well as by the Italian and Spanish custom of indicating distinguished persons by their baptismal names. The account books, which are preserved in the archives of Seville, have in many places the words: 'Amerigo, Cr.'"

Mr. Hugues observes also that while the name of Vespucci is found in Spanish documents under the various and uncertain forms of Vespuche, Espuche, Vispuche,

* Sul Nome "America." Memoria di Luigi Hugues. Torino: Ermanno Loescher, 1886. (Pamphlet, 48 pp.)

Despuchi, and, as written by Columbus, Vespuchy, the name "Amerigo" is correctly given.

On a sober review of the subject the first and sufficient objection to Mr. Marcou's theory is that it does not take into account Waltzemüller's repeated declaration that the name "America" was made by him from the name of Vespucci. He shows, indeed, a preference for the form "Amerige," evidently because this reproduces almost exactly its original. The positive testimony of Waltzemüller as to a fact of which he could not but have entire knowledge must be accepted.

Admitting, however, for the sake of discussion that he might have made a mistake when he wrote the name, and that it was brought by the Spaniards from the New World, how is it to be explained that no one of them has left a hint of it in any writing or tradition, in or out of Spain? The name is not found as a native American name in any record of the sixteenth century; and yet Mr. Marcou would have us believe that Columbus himself and all his companions on the fourth voyage heard this magical name for days together, and were impressed by it to such a degree that the fame of it, never having been told in Spain, leaped the Pyrenees and crossed France secretly to the Vosges Mountains, and was there whispered in the ear of Waltzemüller. There is no more wonderful story than this in the history of America, or in the Arabian Nights.

In his letter from Jamaica Columbus tells of the gold mines he is looking for, and if any one of the native names he heard could have taken hold of his imagination as a synonym for fabulous riches, it would have been *Ciguare*, of which he writes:

"la provincia de Ciguare que segun ellos es descrita nueve jornadas de andadura por tierra al Poniente: alli dicen que hay infinito oro, y 'que traen corales en las cabezas, manillas á los pies y á los brazos dello, y bien gordas; y del, sillas, arcas y mesás las guarnecen y enforran. Tambien dijeron que las mugeres de allí traian collares colgados de la cabeza á las espaldas. En esto que yo digo, la gente toda de estos lugares conciertan en ello, y dicen tanto que yo seria contento con el diezmo."

"the province of Ciguare, which according to their description is nine days' march towards the west: there, they say, there is infinite gold, and the people wear coral ornaments on their heads, and bracelets and anklets of gold, very thick; and they line and cover with gold their chairs and chests and tables.* They said also that the women of that region wore necklaces which reached from the head to the shoulders. In this that I report all the people of these places are agreed, and they say so much that I should be satisfied with the tenth part of it."

Mr. Marcou's theory does not seem to possess the advantages claimed for it. He holds that if the name "America" is found to be American, nothing is taken from the glory of Columbus. What possible relation can there be between the two? The name is, in any case, not derived from the name of Columbus, and the injustice done to him remains the same; but how does this affect his glory? It is with him as with Cassius and Brutus in the funeral procession of Junia; the eyes seek him in vain in the place that should be his, but he is present all the more in the thought of every one.

* Mr. R. H. Major, in his "Select Letters of Columbus," translated and edited for the Hakluyt Society, has missed the sense of this passage by failing to observe the grammatical relation of the pronouns *dello* and *del*, and translating *coral* where he should have written *gold*.

A comparison with the account of the Fourth Voyage in Herrera, Dec. I, lib. 5, cap. 5, where some of the expressions are taken almost literally from the narrative of Columbus, would have corrected the misapprehension. The passage reads:

"i como con tanto cuidado le veian preguntar los Indios por el Oro, dabanle muchas palabras, señalando que por tales i tales Tierras havia tanta cantidad de Oro, que traian Coronas de ello sobre la cabeça, i Manillas en los pies, i en los braços, bien gruesas: las Sillas, Mesas, i Arcas aforradas de Oro" . . .

"and as the Indians saw that he asked with so much anxiety for gold, they gave him many words, declaring that in such and such regions there was so great an abundance of gold that they wore crowns of it on their heads, and anklets on their feet, and bracelets on their arms, very thick; and that their chairs and tables and chests were covered with gold" . . .

There is no charge against Vespucci, and men must accept the accidental greatness he has won.

Mr. Marcou is not happy in the next point made, since, if there be a name of which it can be said that it admits of no confusion between the whole and a part, that name is surely not "America"; for while it properly belongs to the whole Western continent, it is often, by familiar usage, limited in application to a part of North America.

The argument next in order shows, more than is strictly necessary, the cheering influence of the tune of "Yankee Doodle"; and it may be fairly met by the question why any one name in Central America should be allowed the exclusive privilege of facing the Atlantic and turning its back upon the sunset, and stretching itself in long lines to the North and to the South.

Whether the great Admiral ever heard of the *Amerique* chain or not, it is a fact to be noted that map-makers leave it out of their maps, as if by common consent; and students of geography, finding themselves continually baffled in the search for a chain so important, may be tempted to believe at last, in their haste, that Mr. Marcou has created these mountains out of his inner consciousness. In this they would do him wrong. He seems to have been led into error by a mistaken spelling of the name.

There does exist in the province of Chontales, in Nicaragua, a chain of mountains called by the name of the *Amerisque** range, and if this word does not readily

* NOTE.—His Excellency Manuel M. de Peralta, Envoy of Costa Rica, at Washington, has taken some interest in this question, and has kindly furnished for publication the following letter from President Cárdenas, of Nicaragua :

MANAGUA, Mayo 22, 1886.

AL SENOR MANUEL M. PERALTA,
Ministro de Costa-Rica en Washington.

ESTIMADO SEÑOR Y AMIGO :—He recibido su apreciable carta del 26 de Marzo, en que U. se sirve preguntarme si existe, en el Departamento de Chontales de esta

fall into line with the significant names in *ic* and *ique*, the fault lies with the nature of things.

In one word, Mr. Marcou's *Amerique* is a delusion :

" The earth hath bubbles, as the water has,
And this is of them."

República, una cadena de montañas, conocida con el nombre de *Amerique*, *Amerrique*, ó *Americ*, la cual ha sido mencionada por el Señor Thomas Belt, en un libro que publicó en Londres el año de 1873, con el título de " The Naturalist in Nicaragua ": en contestacion tengo el gusto de informar á U. que efectivamente existe en esta República, y en el mencionado Departamento, una cadena de montañas con el nombre de " *Amerrisque*," la que es muy probable haya visitado el Señor Belt, por estar próxima al mineral en donde residió por mucho tiempo. Habita en la cadena mencionada una tribu de indios llamados los " *Amerrisques*," poco numerosa el día de hoy, pero que parece haber sido anteriormente de alguna importancia, segun los indicios que por allí se encuentran. Dichos indios han estado siempre en comunicacion mas ó menos frecuente con el Cabo de Gracias á Dios y la Mosquitia, en nuestra Costa del Atlántico.

Espero haber satisfecho así los deseos de U. y quedo su att'
seguro servidor y amigo

AD. CÁRDENAS.

[Translation.]

MANAGUA, May 22, 1886.

TO MR. MANUEL M. PERALTA,

Minister of Costa Rica at Washington.

DEAR SIR AND FRIEND :—I have received your valued letter of the 26th of March, in which you inquire of me whether there exists in the Department of Chontales, in this Republic, a chain of mountains known by the name of *Amerique*, *Amerrique*, or *Americ*. This chain, you say, has been mentioned by Mr. Thomas Belt in a book which he published in London in 1873, under the title of " The Naturalist in Nicaragua."

In reply it gives me pleasure to inform you that there really does exist in this Republic and in the Department named a chain of mountains known by the name of " *Amerrisque* "; and it is very probable that Mr. Belt visited these mountains, which are in close proximity to the mine where he resided for a length of time. There lives in this chain a tribe of Indians called the *Amerrisques*, feeble in number at the present day, but apparently of some importance in former times, to judge by the indications found in the region.

These Indians have always been in communication more or less frequent with Cape Gracias á Dios and Mosquitia, on our Atlantic coast.

I hope that this information will be satisfactory to you, and I remain,

Most faithfully,

Your friend and servant,

AD. CÁRDENAS.

ON THE EXTERMINATION OF THE GREAT NORTHERN SEA-COW (*RYTINA*).

A REPLY TO PROFESSOR A. E. NORDENSKIÖLD.

BY

LEONHARD STEJNEGER,

SMITHSONIAN INSTITUTION, WASHINGTON, D. C.

In an article in the *Ymer*,* for 1885 (pp. 246-267), and translated in this BULLETIN (1885, pp. 267-298), Professor Nordenskiöld, while replying to my remarks on certain points in his "Voyage of the Vega," by way of introduction complains of their "sharp tone." As but few of the readers of the BULLETIN may have had an opportunity to read the papers commented on, I may be permitted to make a few extracts. My letter to *Naturen*, written on Bering Island, commences as follows: "You will understand that only the most urgent necessity forces me to criticise the 'famous professor's account contained in his famous work'; but the longer I lived here [Bering Island], and the oftener I read his account comparing it with what I myself have ascertained on the spot, the more urgently I felt called upon to correct a great many of his statements. I was especially encouraged to do so by reflecting that the longer the errors remain undisputed, the firmer hold would they get on the public mind as indisputable, the more difficult it would later on become to rectify the er-

* The organ of the Swedish Society of Anthropology and Geography.

roneous impressions. Any one considering the fact, that statements made by travellers of little consequence may be found reiterated even in the latest publications, in spite of their having been refuted time and again, will understand how extremely difficult a task it will be to eradicate errors which originate from a book of such a circulation as Nordenskiöld's '*Voyage of the Vega*,' and which are supported by a name of such authority as his." My article in the "*Proceedings of the United States National Museum*," for 1884, closes as follows: "That a scientist of Nordenskiöld's well-known thoroughness and merit could fall into those mistakes may, perhaps, be explained by the fact, that in the hurry of the short stay at the island he was too impatient to wait for the often protracted and indefinite answers, therefore indicating what replies he expected or wanted, a hint most certain to be followed by the natives. Besides, his account seems to have been written down, for the greater part from memory, the original notes having been either lost or insufficient."

So much for the tone, which—it seems to me—speaks for itself. I must also protest against Nordenskiöld characterizing my remarks as "violent attacks" * on his statements. I simply pointed out misunderstandings and corrected mistakes, and only in one instance have I taken the liberty to censure the learned professor, and that in terms the "tone" of which, after renewed consideration, I find to be very mild. But in regard to this very matter Professor Nordenskiöld, in his reply, intimates that it "may be dismissed," claiming, as he does, that in his "*Voyage of the Vega*," he made the necessary correction

* "*Häftiga anfall*"; in the translation rendered by "very strong charges."

in regard to the number of killed fur-seals, which in his first report he had erroneously given as 150 per centum larger than the number actually slaughtered. Now, what I censured was that, in the "Voyage," he did *not* unconditionally correct his erroneous statement, based on an "oral communication," when confronted with the official and indisputable figures. The slur and suspicion which he threw on these I marked as "indefensible." This expression, I repeat, is very mild, when I ought to have used the word "inexcusable." However, I am glad to learn that he has now admitted his blunder without reservation.

Professor Nordenskiöld passes lightly over a number of questions as "comparatively small matters"; for instance, the situation of the village of Bering Island, the color and number of the arctic foxes, and the extirpation of the sea-otter. Yet they are of special importance in connection with our discussion of the extermination of the sea-cow, demonstrating, as they do, that he made capital blunders in describing every one of the larger animals of the island, and that "the account does not—at least not always—rest on notes written down on the spot." Logically the question may be put thus: When it is seen that Nordenskiöld so thoroughly misunderstood the residents, in regard to animals which lived on the island in great numbers at the time of his visit, what assurance have we that the alleged statements in regard to the sea-cow (*Rytina gigas*) do not, in a similar manner, rest on mistakes and misunderstandings? And in this connection I may call attention to the fact, that Nordenskiöld, in his reply, has not attempted to deny that he was mistaken in all these statements. Only in regard to

the existence of the sea-cow after 1768 does he maintain his original position, reprinting what he said on the subject in the "Voyage," but without even attempting a refutation of my arguments, or demonstrations of his many mistakes in the details. Some general reflections, as to the method of examining "hunters," and his own long experience, etc., accompanied by the question, with what right I claim superiority for my examination, is all he puts forward to weaken my evidence. I shall now proceed to discuss these remarks in the order adopted by him.

Professor Nordenskiöld, at the outset, mentions that he examined the two men said to have seen a live sea-cow in 1854 separately, through an interpreter, "without any assistance from the authorities, who, as experience has taught me, *if present at such transactions, have only a bewildering and confusing influence on the natives.*" If Nordenskiöld by this sentence, and especially by italicizing it, intends to intimate that, on the occasion referred to, I had any assistance from the "authorities," then I will only say, that the implication is entirely without foundation: *I* did not need experience to teach me that with that kind of people one gets along better without the assistance of the "authorities." Let us then make a comparison between the conditions under which the two examinations—his and mine—were made. When Nordenskiöld made his inquiry, during his five days' stay, the unexpected arrival of the *Vega* expedition had naturally thrown the little village into an excitement approaching to fever heat. The regular steamer *Aleksander*, was there, too, and its presence alone is sufficient to upset the population. Nordenskiöld—the leader of

so great a concern—was himself an “authority,” and, besides, a complete stranger to the people. Moreover, he was in a hurry; indeed, during my sojourn at the island, I was assured that his mistakes were not to be wondered at, taking into consideration the haste with which every thing was done. My examination, on the other hand, took place under quite different circumstances. It was not made until later in the year, when every thing was quiet and peaceful on the island, at a time when its only “authority” was abroad; we had all plenty of time, and nobody was in a hurry; the questions were all well considered, and *committed to paper beforehand*, with the exception of one or two which were occasioned by the answers of the men; having lived on the island for nearly a year I had become well acquainted with the natives, with whom I was on the most friendly terms. Nobody with an unprejudiced mind will deny that my examination took place under circumstances more favorable than those attending Professor Nordenskiöld’s inquiry, and it will be seen, from what I have published at an earlier opportunity, that I was able to verify some of the statements through other witnesses, and also by the church records. Against Nordenskiöld’s reference to his general knowledge of examining “hunters,” gained by a twenty-five years’ experience, I may safely point to my one year’s personal and special knowledge of the two “hunters” here in question.

Inasmuch as the exact wording of the twenty questions I asked the men has been before the scientific public for about three years,* I consider it unnecessary for me to

* See “Proceedings U. S. National Museum,” 1884, pp. 181-189: Contributions to the History of the Commander Islands, No. 2, Investigations Relating to the Date of the Extermination of Steller’s Sea-Cow.

reply to Nordenskiöld's question: "Is Mr. Stejneger quite sure that his interrogations were better and more naturally put than mine?" The burden of proof rests with Professor Nordenskiöld. He, and everybody else, has had the opportunity of seeing what questions I asked, and how I asked them. But until he shall have produced his questions and demonstrated their superiority, I may, perhaps, be permitted to prefer mine.

I have nothing further to say in regard to this examination, the minutest details of which I placed before the public a long time ago. I shall not prolong this reply by reprinting them, and there is absolutely nothing to add: I have referred the case to the scientific world for judgment. It is only surprising, that *any one* who has read it can still retain a shadow of belief in the existence of a living sea-cow in 1854 (or 1846).

Professor Nordenskiöld's version of old Burdukovski's story is even less tenable. In my conversation with the latter, which took place under the same favorable circumstances as the other interrogatories, I began with having the part of the "Voyage of the Vega" relating to him translated word for word. At nearly every point he protested against the narrative as being incorrect, saying that he was at a loss to understand how Professor Nordenskiöld could have misunderstood him so completely. This will suffice in reply to the *reprint*, in the *Ymer*, and in this BULLETIN, of the paragraph in question, since a full refutation of it, as well as a complete and verbal rendering of Burdukovski's statements to me have been published in my article in the "Proceedings of the U. S. National Museum" already alluded to.

I may, however, be permitted to say a few words in re-

gard to Professor Nordenskiöld's characterizing my arguments for rejecting Burdukovski's testimony as "entirely artificial and arbitrary." * Twenty-five years' experience does not seem to have taught the professor to receive the stories of "hunters" with caution. Has he then never met with men of that class, who, knowing the impossibility of anybody present being capable of disproving them, would represent themselves (no matter for what reason) as eye-witnesses of some memorable event, the details of which they knew? The sole object of my "artificial and arbitrary" argumentation was to advocate caution, particularly since 107 years had passed from the time the older Burdukovski is said to have seen the last sea-cow killed, until his son retold the story to Professor Nordenskiöld. I advocated caution, because I knew, from personal acquaintance with these very people, that their memory in regard to time and events is utterly defective, and I maintain that their chronology and statements as to what took place, or was said, such a long time ago are *entirely* worthless, a good illustration of this being afforded by Merschenin, one of the witnesses, who could not state with any degree of certainty when he saw the alleged sea-cow—nay, was unable to give the precise age of his oldest son. I advocated caution, because Vosnessenski, the able and accomplished conservator of the St. Petersburg Academy, who visited Bering Island about the time when the older Burdukovski died; who was searching for, and found, parts of the skeleton of the sea-cow, and who was, no doubt, instructed

* The translator of Nordenskiöld's original article has evidently been at a loss to find an English word that would correctly render the Swedish word "advokatorisk." It means literally "a lawyer's (advocate's) argument," and *may* contain a slight implication of trickery. The above translation comes sufficiently close.

both by v. Baer and by Brandt to ascertain the fate of the animal;—I advocated caution, I say, because this traveller failed to report that a man had recently died, who in his youth had seen living sea-cows. In short, I considered then, and still consider, Burdukovski's story as too slightly founded to serve as the basis for a rejection of Sauer's *express* statement that the last sea-cow was killed in 1768.

Nordenskiöld endeavors to weaken Sauer's remark by intimating that Sauer *may* have written it down from memory, quoting him, as he does, in the following manner: "Sauer himself says in his preface, that he has had access to a copy of the ship's journal (where, of course, no remarks of the kind here in question were to be found), but that his notes, *otherwise*, were so very incomplete that he was *often* obliged to trust to his memory" (*italics mine*). This is certainly a very "*free*" version, to put it mildly. Sauer himself says, *verbatim*, as follows ("Account," etc., p. xii.): "During my travels, I was frequently necessitated to make notes on small pieces of paper—*those I have faithfully transcribed*; but *in some instances* I have been obliged to refer to memory"; and in the footnote on the next page: "My *narrative of the voyage* is taken from the journal written for Captain Billings, which I copied from the ship's journal" (*italics mine*). "*Some instances*" does not mean "*often*"! And as Sauer does not indicate his notice in regard to the extermination of the sea-cow as one of these few "*instances*," we may safely assume that in this case he was not obliged to trust to his memory. It is also worthy of note, that Sauer, when prevailed upon to join the expedition, made it an express condition, that he should have a right to

publish what notes he might make (p. ix. : "On receiving the promise of permission to publish my remarks, upon my return, I agreed"). He started, consequently, with the avowed intention of writing notes for later publication; his book was, therefore, no after-thought. Norden-skiöld furthermore asserts, that "to judge from the narrative of the voyage, Sauer himself seems not to have been on Bering Island, and the notice is given, by the way, without naming its source, and without any intimation from the author as to the importance that should be attributed to the statement." * This is, no doubt, in the main, correct, but there is, nevertheless, a possibility that we may be able to point out his source with a probability bordering on certainty. However, I may first mention, how it happened that Sauer, who was no professional naturalist, came to be interested in such questions. It must then be remembered that the expedition was sent out at the request of Pallas, the great Russian zoölogist, at a time when he was collecting material for his "*Zoögraphia Rosso-Asiatica*." A naturalist was to accompany the expedition, and Pallas himself wrote his instructions, but the man selected to fill the position lived in Irkutsk. Further, Sauer was a personal acquaintance of Pallas, who persuaded him to go. Nobody has doubted that Sauer was a very intelligent man, who travelled with his eyes and ears open. Is it, then, credible that Pallas, knowing that the expedition was to touch at Bering Island, if possible, † should have failed to direct Sauer to

* The last paragraph, as rendered in the BULLETIN, does not quite express Nordenskiöld's meaning, as written in the original, which may be translated more correctly as follows: "the notice is given . . . without the author having any idea of the importance which later on might be attributed to his statement."

† See the instructions to Capt. Billings, Art. x.; "Account," etc., App., p. 39.

look into all the circumstances relating to the history of the sea-cow, the same Pallas who had induced Dmitri Bragin to keep a diary during his sojourn on Bering Island, in which Bragin enumerated all the animals found there, except the sea-cow.

It is of no consequence that Sauer had no opportunity to visit Bering Island personally. He travelled for several years in the neighboring regions, and for long intervals at a time he associated with men who had been living on that island, and whom he questioned in regard to the conditions there (see especially "Account," etc., pp. 281 and 306). In fact, it is plain from every page of his book that he was not afraid of asking questions whenever he was unable to obtain information otherwise.

If we now examine his account closely, we will find that his reason for mentioning the extermination of the sea-cow under the description of Kodiak (which commences as follows: "Here we made the following observations," p. 170) in all probability is due to his having received the information in regard to this event during his stay there. Under this supposition—and no explanation can be more natural—there is no room for doubt that his informant was Yefstrat Ivanitsch Delareff, then Schelikoff's agent at Kodiak. It is evident from several of Sauer's remarks that he placed implicit confidence in this man, and he mentions him in a number of instances as the one who gave him valuable information (see, for instance, pp. 171, 173, 174, and especially p. 197, on which he prints one of Delareff's statements *verbatim*.) That Sauer had ample time to question Mr. Delareff is certain, as he stayed at Kodiak two days longer than did Nordenskiöld at Bering Island, and, moreover, it appears

from the account, pp. 184-186, that Delareff accompanied Billings' expedition during the whole of the week following, viz., from July 6th to July 12th. It is, furthermore, an indisputable fact that Delareff wintered on Bering Island from August 10, 1781, to some time in the spring of 1782, consequently eight years before Sauer met him at Kodiak (see "Account," etc., p. 37). We have here a series of important facts which to the unprejudiced mind furnish a probable evidence of great strength to the effect that Sauer's statement is, by no means, a notice given "by the way," and without authority. There is no reason to doubt that Sauer fully understood the bearing of the statement, and we are, perhaps, permitted to assume that he did not enter into fuller details, since the extermination of the sea-cow was a fact so well known in the regions he visited, that he considered any further elaboration of the subject to be superfluous. That Sauer's account of the voyage was not *printed* until twelve years after the stay at Kodiak is, of course, quite immaterial. If, at the same time, we take into consideration that there is plenty of corroborative evidence—for instance, Bragin's list of Bering Island animals—I think I have shown Nordenskiöld's assertion that "there is no warrant whatever for the year 1768, so much written about," to be unqualifiedly wrong. He has in no way weakened the force of Sauer's express statement of the year 1768 being the year of extermination of the great northern sea-cow.

May I now be permitted to ask this question: If my doubt as to the correctness of the old "hunter's" chronology and statements in regard to what his father saw 107 years ago deserves the epithets "artificial and arbi-

trary," how, then, is Nordenskiöld's criticism of Sauer to be characterized? "Artificial and arbitrary"??

Little or nothing needs to be added,* for I have placed all the material I gathered before the public. I have done all in my power to enable my colleagues to form their own opinion: they need not take any one's word, either for or against. The case is pleaded and closed on my part, and I am quite willing to abide the verdict without further argument.

* Nordenskiöld sees fit to announce at the end of his reply to me that Malm described a fragment of a skull brought home from Bering Island by the *Vega* expedition as *Berardius vega*, but he ought to have informed his readers at the same time that the same species was described by me, the year before, as *Berardius bairdi*, from a perfect skull now in the U. S. National Museum ("Proc. U. S. Nat. Mus.," 1883, p. 75). He might also have added, that I discovered two other new species of ziphoid whales at Bering Island, one of which I described as *Ziphius grebnitskii* (*tom. cit.*, p. 75), while the other one received the name *Mesoplodon stejnegeri* TRUE (*op. cit.*, 1885, p. 584).

ANCIENT HABITATIONS OF THE SOUTHWEST.

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After extended research and a brief review of the written accounts bearing upon the subject of the ancient habitations of the southwest, it must be confessed that, until very recently, nothing was actually known concerning the ruins and relics it is now our task to describe in detail. Nor does it seem that we are yet in possession of material sufficiently extensive to warrant positive conclusions concerning the unity or non-unity of the ancient cave- and cliff-dwellers and the inhabitants of the present pueblos. On this subject written history is mute and legend is confused and misty. Judgment must therefore await the slow and careful plodding of compositive ethnology, to sift evidences, compare and contrast the similar works of art, and find, if possible, the links that bind the present to the past. Herein is, at least, safety.

As one of the principal objects which I proposed to accomplish this year was an exploration of the cliff-dwellings within the Cañon de Chelly, a party under my direction was organized at the house of Mr. Thomas V. Keam, consisting of the following persons :

Mr. J. K. Hillers, photographer ; Mr. B. Wittick, photographer ; Mr. Victor Mindeleff, ethnologic ass't ; Mr. A. G. Gustin, ethnologic ass't ; Mr. E. A. Oyster, ethnologic ass't ; Mr. J. Stanley Brown, disb'g agent.

Mrs. Stevenson, and Messrs T. V. Keam, J. McEwell,

and Col. H. C. Rizer, of the Eureka, Kansas, *Herald*, also accompanied the party, which was completed by the addition of four soldiers of the Thirteenth Infantry, kindly detailed for the purpose by Gen'l Bradley at Fort Wingate, N. M., two teamsters and their teams, and two Navajo Indians as guides.

Setting out from Mr. Keam's ranch we proceeded in a northeasterly direction across a broken country, and after a journey of fifty-six miles reached the mouth of the cañon near the western edge of the Navajo reservation. To our surprise we found that the stream which occupies the bed of this famous chasm during the rainy season was entirely dry, and that a bed of loose sand extended from one wall to the other of the cañon. These walls, quite low at the extreme entrance, became higher and higher as we advanced farther in, and were formed of a rich red sandstone, which was streaked and variegated with dark-red, purplish, and blackish discolorations, caused by the trickling down of water from above and by the action of the weather upon the metallic oxides contained in the rock.

The cold wind that had been blowing during our passage across the plain seemed to eddy in the confined space of the cañon, assailing us in the most uncomfortable manner as we rode onward. The wagon and other vehicles of our party sank deeply into the sand, rendering it extremely difficult for our animals to draw them. I pushed on ahead with the intention of selecting a place for our camp some five miles up the cañon, but found after proceeding about two miles that the wagons would not be able to go farther. Hereupon, finding a sheltered recess on the north side, I awaited the arrival of the party with the teams. I discovered that a Navajo

had recently been here before me. He had built his hut on a sloping sand-dune, had formed a corral and dug a water hole for his animals at the foot of an immense tower-like rock. Here was also pretty fair grass for our animals. In due time the party arrived, glad enough to find even a partial shelter, for the weather was cold, and at sunset the clouds gave ominous signs of rain. The wind swept in whirling eddies around us so fiercely and unsteadily as to render it extremely difficult to cook our supper. Every gust of wind came freighted with its full cargo of sand, so that every mouthful of our food was highly seasoned with grit. Had our stomachs been gizzards we should have delighted in this addition to our repast. They were only stomachs, however, and could not appreciate this extra delicacy. Still each determined to make the best of the situation and to laugh discomfort out of company. Out-door exercise brought hunger, and hunger is an all sufficient condiment. We ate and were satisfied. Dinner over, we all gathered around the fire to crack jokes with the Navajos, who had flocked around us and were feasting off the remains of our meal. They were very friendly, but seemed very much puzzled to account for our being there. By eight o'clock every one had spread his blankets in the most sheltered spot he could find and gone to sleep, perhaps to dream of love's *ritornello*.

The night passed without rain, and as soon as an early breakfast was over we started up the cañon. The sand was very deep, and the morning was cloudy and cold, and as we plodded slowly along squalls of rain and hail succeeded each other every few minutes. About a mile above our camp we came to the first cave with ruins in it.

It was situated on the north side of the cañon near the mouth of another large one which branched from it. Into this we entered. According to our guide's report, it had never before been explored by white men. I afterwards gave it the name of Cañon de los Muertos, or "of the dead," in commemoration of certain discoveries there made, which will be related further on. Leaving Mr. Mindeleff, aided by one of the guides, Navajo George, to climb up to the first cave and make a sketch of the interior and ground plan of the ruins, while another sketch of its position in the cliff was taken from below, I pressed forward with the rest of the party. From this point onward there was a continual succession of caves and rocky shelves, sheltered by overhanging cliffs. All these contained ruins of greater or less magnitude, and the greater part of them were at heights varying from fifty to one hundred feet above the base of the cliff, and mostly on the north side of the cañon. Several very notable ones were, however, discovered on the south side. Among these latter was a group of small houses in a huge fissure, which appeared to be at least 300 feet above the cañon bed. As we went farther up the stream the walls of the gorge increased in height, until at a distance of twelve miles from the mouth, where we encamped for the night, they were not less than 600 feet high, with an aspect of stupendous grandeur. Here we went into bivouac for the night. *October 11.*—The nakedness and aridity which we had noticed at the mouth of the cañon had been gradually giving place, first to moisture, then to coarse grass beneath the frowning cliffs. Now and then a stunted and scarred cottonwood put in an appearance. Its foliage, perhaps from contrast with the

red and purple colors of the rocks and the gray sand of the river bed, was most brilliantly green. Still farther on, a trickling stream made its appearance, and farther still this became a brook of good size, and vegetation became better and stronger. Pines and cedars grew in the clefts and high up among the fallen rocks upon the foot-slopes, and small groves of cottonwood and diminutive oaks grew in the sandy bottom that bordered the river bed. Here and there a small group of peach trees, planted by the Navajos, enriched and enlivened the coloring of the landscape, while the prickly pear became very uncomfortably abundant. This night our camp was almost directly in front of one of the huge oven-like caves. We named it the "Royal Arch." Around the lower part of this extended a shelf, and on this shelf we found the remains of a village. Several small buildings still remained standing to testify of what all once were, but by far the greater part were in utter ruins. Our search in this old-time building was rewarded by finding two worn sandals, very like the "alpargatas" now in use in Mexico and some parts of South America. They were made of the fibre of the yucca. One of them was ornamented with a design in colors woven into the texture of the article. There were also found several pieces of well-constructed cord made of the same fibre, and one piece made of what appeared to be rabbit-fur enwrapped with the split shafts of feathers. But the most interesting discovery of all awaited our search two miles farther up the canon. There, at the entrance of a canon from the north, in a huge cliff of red sandstone, the outlines of which suggested the figure of a crouching lion, or, as some of our party thought, of a sphinx, we

found an immense double cave containing the well-preserved remains of a village, which actual measurements, made on the two succeeding days, showed to be larger than some of the present Moqui towns. This double cave itself presented some very remarkable features. The huge main cave is divided by a rock projection into two smaller ones of unequal size, the roofs of which, seen from the front, are elliptic arches. Around the interior of these smaller caves, and passing in front of the buttress-like projection that separates them, runs, at a height of about 100 feet above the bed of the stream, a shelf continuous from end to end, ten feet wide at its extremities, then narrowing, and again widening in the centre of each cave. Its figure, as viewed from end to end, is somewhat like to crescents with their concavities turned cañonward, and united by a long parallelogram. The entire shelf somewhat rudely reminds one of Cupid's bow.

This shelf is accessible by climbing a steep bank of sand and broken stones which have fallen from above. On ascending it we found it covered with ruined dwellings and chambers. Among these latter in the right-hand cave are four circular chambers or *estufas*. On the portion in front of the dividing rock is built what appears at a little distance to be a castle, or fortress, with a tower of three stories, twenty-eight feet high. This stands at the end next the larger cave, while at the other end stands a similar tower, the two connected by a range of buildings one story in height. All this is very clearly shown in one of the sketches made by us; so also is the general appearance of the large cave with its two internal ones and the range of ruins within them. The buildings

are all made of stone laid in quite regular courses and cemented with clay. The three-story tower and the buildings in the centre, and the *estufas* in particular, show very excellent workmanship, although these last are very dilapidated, but little of their walls remaining upright. The large tower presents the peculiarity of being accessible only by passing through the interior of all the range of lower houses adjoining it, which open from one into another, the entrance to the whole range being through a low door in the smaller tower at the other end. Mr. Victor Mindeleff, of our party, made an accurate survey of the ruins with a view to modelling them. Mr. Hillers made some very fine large photographic views of the interior of the cave, and Mr. Gustin made water-color drawings of the cliff and cave from the exterior; so that from the combined works of these gentlemen a very accurate idea of the ruins and their surroundings can be gained. A very interesting discovery was made by Mr. J. Stanley Brown while climbing a pile of débris which gave access to the larger cave. Noticing some pieces of wood projecting from the rubbish, he cleared away the sand and stones with his hands, and found that he had come upon the corner of a small enclosure. Digging still farther, he discovered a burial crypt of a pentagonal form, composed of small wooden logs and lined with flat, irregular slabs of stone. This enclosure contained two skeletons, which had apparently been buried in a sitting, or rather a squatting, posture, the knees drawn upward toward the chin and the hands crossed on the breast. The dried flesh still covered the bones of the greater part of the body, which was enveloped in a coarse net made of some vegetable fibre. A

few grains of Indian corn were found in the grave, but no pottery, ornaments, nor arms of any kind. The bodies were carefully taken out of the crypt and preserved for future study. It should here be noted that in an article upon the "Human Remains Found among the Ancient Ruins of Southwestern Colorado and Northern New Mexico," published in the Bulletin of the Geol. and Geog. Survey of the Terr., vol. ii., No. L., Dr. Emil Bessels, commenting upon the statement of Mr. Holmes, that the skeleton to which he refers was apparently buried in a squatting position, says: "We do not doubt that the position in which the bones were found indicated a squatting posture of the skeleton, but it is not probable that this posture was commonly in use for burying the dead." This opinion of Dr. Bessels does not appear to be borne out by the facts, as will be seen from the article upon "Modes of Burial," in Smithsonian Contributions to Knowledge, vol. xxii., p. 32, *et seq.*, where this practice is proved to have prevailed over the whole continent of America. From this article I quote as follows: "Dr. Morton, in his 'Crania Americana,' gives as an additional evidence of the unity of race and species in the American savage nations, the singular fact that from Patagonia to Canada, and from ocean to ocean, and equally in the civilized and uncivilized tribes, a peculiar mode of placing the body in the sepulchre has been practiced from time immemorial. This peculiarity consists in the sitting posture." Dr. Morton describes the mummy of a Muysca Indian of New Granada in these words: "In this instance the body is in a sitting posture, the legs being flexed against the abdomen and the feet turned inwards. The arms are also bent so as to touch the chest, the chin being sup-

ported in the palms of the hands and the fingers received into the hollow beneath the cheek bones." It is needless to call attention to the similarity of this posture to that of the skeleton found in this cave.

He further says that the body is not embalmed but only desiccated, yet the muscles are so well preserved as to render it probable that some antiseptic fluid may have been applied to them. Another instance of this custom, in addition to the many given in the above-mentioned article, is to be found in the report of the Archæological and Ethnological Investigations of Dr. S. Habell, published under the number 269 in *Smithsonian Contributions*, vol. xxii., p. 32. In an excavation made by him in the square of the village of Apaneca in the State of San Salvador, Central America, he came, by good-fortune, upon an ancient grave. It was formed by four porphyritic slabs more than three feet long and two feet wide, standing upright in a kind of semicircle, and another slab lying horizontally at the bottom of the grave. After the removal of the earth to the depth of about three feet the interred body was reached. All the bones were so brittle as to crumble at the slightest touch. By removing the earth with his hands with the greatest care the clavicles, as well as the bones of the arms and thighs, especially the head of the latter, could be seen. They showed that the body was buried in a crouching position. At page 62 he says: "We opened one grave (at the Bay of Paraca in Peru); after the removal of the sand to the depth of two feet and a half we came to the body in a crouching posture encircled by pieces of split bamboo."

Having given as much time to the examination of the caves in the Cañon de los Muertos as circumstances would

allow, some time before noon on the 13th of October we broke camp and moved down the gorge to its junction with the main cañon, and up this latter. We had hardly begun our march when the wind began to blow, and kept on increasing in violence, carrying before it clouds of loose sand and even small pebbles, until at times it was with great difficulty that we could face it. We bivouacked in the main Cañon de Chelly, about five miles above the mouth of the branch Cañon de los Muertos, the wind and sand giving us a most uncomfortable night. On the way up we passed four important groups on the northern side of the chasm, all of them in caves varying from twenty to fifty feet from the bed of the cañon; but the sandstorm that raged around us prevented any examination of them on this day. The next day we moved three miles farther up, encamping in a branch that enters from the south, near the foot of the great isolated, obelisk-like rock, which we called "The Monument." This "monument" and another columnar buttress of almost equally striking appearance on the opposite side are called the "Captains of the Cañon" by the Navajos. Three other large caves, full of ruins, were seen and sketched to-day, but were too high up to be accessible without special apparatus for climbing. The next two days were spent in explorations of the main and side cañons, and in sketching the ruins we had passed on our way up. Mr. Mindeleff made a survey of the ruin called the "White House," about five miles back; and Mr. Hillers took many excellent views of the scenery.

A large cave containing two ruins, one about 50 feet above the other, was discovered in a recess on the west side of the branch cañon about two miles south of our

camp, and sketches were made of it. This cave was situated high above the bed of the gorge, and the upper tier of the ruins was nearly, if not quite, 200 feet from the bed below. On our way down again several hieroglyphics were found on the flat face of the rock on the north side of the main chasm, but far above the place where we camped on the day we first entered it, and where we encamped the night before we left it. A few were also found about one quarter of a mile from the mouth of the cañon, and also on the north side. Both were copied, and form part of the records of the expedition.

Early in November, 1882, I made preparations for taking a party to Acoma, to make studies of that very interesting town and to collect some of the pottery made there, but on arriving at the place I found it full of small-pox, and was obliged to retire before the disease. I then proceeded to the head-waters of the Rio Grande, west of Santa Fe, to make a further and closer examination of the remarkable cave dwellings at the north of the Pueblo of Cochiti, and explored those which exist in the cañon called by the Mexicans "El Rito de los Frijoles," or, literally translated, "The Rite of the Beans." The Cochiti Indians called it Gunuye, or, as it was translated to me by the Indian guide, Juan Jose Montaya, "The Place where Customs and Rites are Prescribed." The cliffs on the north side of this cañon are perpendicular, or nearly so, and are composed of friable tufa, and vary from 50 to 100 feet in height above the foot-slope that runs down to the clear, cold, unfailing stream at the bottom. The bases of these cliffs have been hollowed into a great number of small caves, which appear to have been the dwellings of a race of Indians.

The cave in which I dwelt while studying the locality was circular in form, measuring about 15 feet one way, and 12 feet the other, the roof being dome-shaped and 9 feet high in the centre and blackened with smoke. It was excavated in a projecting buttress of rock, leaving a wall varying in thickness from 1 to 2 feet on the side next the cañon. The entrance was by a small door at the level of the ground, $2\frac{1}{2}$ feet high, nearly 2 feet at the bottom, and considerably narrower at the top, so that by crouching down I could barely squeeze in. There was a larger opening on one side, which appeared to have been formed by the weathering of the rock. The lower part of this opening had been closed up with large stones by persons who had occupied the caves before me. This enclosure formed a bow-shaped recess with an opening to the outside above. This recess we used for a fireplace. Above this, one on each side, were two irregularly shaped holes, which looked as if they might have been used as windows, but were not over 1 foot in diameter. In the wall, $2\frac{1}{2}$ feet from the floor, were two small, shallow niches, flat on the bottom and arched above. The weather was cold, and snow eight inches deep was lying on the shady side of the cañon; but we found the cave a very comfortable place to sleep in, a small fire keeping it very warm and cheerful.

In many of the caves that I examined there was a flooring of fine red clay, very neatly and smoothly spread. In several, thin layers still exist, and also the plastering of red and yellow clay with which the walls were finished inside. In some of them the lower part of the wall is of one color and the upper part and ceiling of another, the two colors being separated by a broad line of dark brown

or black which runs around the cave about two feet above the floor. The walls often contain small niches. Sometimes a low seat is left around on one side of a cave, and in several cases there were smaller caves behind the principal ones, but with extremely small doors of communication between them. In some cases the cliff has fewer caves, and these few are placed higher up in the face of the cliff, while below them are small rectangular spaces that appear to have been hollowed out of the rock and smoothed to form the real wall of a chamber. That such a conclusion is correctly inferred is shown by the following facts, viz.: There still remain distinct traces of the red and yellow clay plastering on these walls. There are rows of small round holes above these smoothed places.

There are considerable quantities of roughly squared stone at the foot of the cliff immediately below the caves. These stones indicate that they were formerly laid in a wall in front of the cliff. The rafters for supporting the roof had their foothold on this mason-work, while their inner ends rested in the holes above the smooth wall. Thus was formed a lower room with a front and sides of artificial wall resting against a back of natural wall. In some cases there appear to have been two, and even three tiers of dwellings constructed in this manner. The caves above seemed to have been entered from the roofs of the top tier, although some of them had their entrances through openings within the outer houses, thus constituting the caves so many inner chambers to the outer front rows. The caves extend along the base of the cliffs on the north side of the cañon for a distance of about two miles, the rock in some places being full of them close together and two or three tiers high. In

others they are more sparsely scattered along its face. Nearly opposite to where the trail from Cochiti descends steeply into the cañon I found a number of caves that are externally finished with masonry of stone cemented with clay, of which a good deal remains standing. In several caves were to be seen the remains of smaller rafters in holes near the ceilings, which apparently extended across from one side to the other, and may have been used for hanging up articles of clothing, arms, or food. I was unable to find any arms or utensils, although bits of broken pottery and chips of obsidian were abundantly scattered over the ground. The ruins of six large circular chambers or *estufas*, and of several groups of dwellings built of stone, are distributed over the slope, which reaches from the foot of the cliffs on the north side of the small stream that flows in the bottom of the canon, and two deeply worn trails lead out of it. One conducts to a ruined pueblo which lies on the mesa, the other leading off towards San Ildefonso, an Indian pueblo which is still inhabited.

It is thus seen that there existed many tribes of people who had a claim to a civilization peculiar to themselves, which, when more studied and better understood, will bring us closer and closer to a history of our predecessors, and may give us a little insight into our apparently lost birthright.

GEOGRAPHICAL NOTES.

BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY OF ROME.—This society, founded in 1865, mainly through the exertions of Mr. Drury Fortnum, F.S.A., has contributed, though in but a limited degree, to the exploration of the Roman remains. The late Mr. J. H. Parker, the well-known archæologist, was its most active member during the years 1871–1875; and an exploration fund raised by the members was the means of revealing the site and the ruins of the Porta Capena.

The objects of the association are to concentrate and assist the researches of English and American antiquaries in Rome, and to furnish information and means of study to visitors who interest themselves in archæology. Its collections of books, photographs, and drawings are already of considerable value, and the society is now making an effort to establish itself on a solid basis, in order to extend its sphere of usefulness.

According to the new rules adopted, the society is to consist of members and associates, the former being its permanent constituents, the latter enrolled for the season only. None will be chosen members but those who have some claim to the title of archæologists, and who may be capable, whether present in person or not, of furthering the objects of the organization.

It is the wish of the Council to enroll among the members antiquaries who have made a study of classical

antiquities, and to raise, also, by donations, a small fund in aid of the library and collections.

Earl Percy has been elected President, and among the Vice-Presidents are the British Ambassador and the American Minister.

The yearly subscription for members and associates is 25 francs. Donations and subscriptions may be sent to the Hon. Secretary, the Cav. Arthur Strutt, 81 Via della Croce, or to the Treasurer, I. C. Hooker, Esq. (Maquay, Hooker, & Co., bankers), 20 Piazza di Spagna, Rome.

PROPOSED NEW ROUTE *via* HUDSON'S BAY AND STRAIT TO THE GREAT PRAIRIE LANDS OF CANADA.—At the Birmingham meeting of the British Association for the Advancement of Science the advantages and disadvantages of this new route were very fully discussed. Mr. Hugh Sutherland believed that the route would be the natural outlet for the trade of Minnesota, Dakota, Montana, and Wyoming, as well as for that of the whole of the Dominion of Canada west of Ontario. He foresaw, moreover, an immense development of the salmon, seal, and whale fisheries of the Bay itself, and of the vast resources in timber and minerals of the coast regions.

Dr. John Rae took a less hopeful view of the project. The results of his experience and study, as published *in extenso* in the *Scottish Geographical Magazine* for December, are :

1st. That the only apparent advantage of the route would be the shortening of the distance by 400 or 500 miles (more or less) to Liverpool, according to the position on the prairies from which the measurements began. This difference of distance would occupy a loaded

steamer not more than two days ; but this apparent gain would be more than counterbalanced by a probable average detention by the obstruction of three or four days on each voyage.

2d. That the disadvantages are, the short time—three, or three and a half months—each season, during which Hudson Strait is sufficiently open to be navigable ; and the danger to long and large heavily-laden steamers, if caught by a “nip,” in the ice-pack.

The length of the Strait is 400 miles, and Lieut. Gordon, who was there in the *Alert* in 1885, says in his Report : “The date (for the passage) for this year I place at from July 5th to 15th, as it is more than likely that a ship could have got *through the Strait in ten days*.” Further on, he adds : “The information we have got would point to the months of July, August, September, and October as being the months in which the Strait is passable. As a rule, in July there would be delays.”

Dr. Rae, whose personal acquaintance with the navigation of the Strait goes back to the year 1833, cuts off from Lieut. Gordon's estimate the first two weeks of July and the last two of October ; and he notes two occasions, one in July–August, 1833, the other in Sept., 1854, on which his vessel was entirely closed in by ice, so that it became a question whether the voyage should be given up as hopeless.

The passage through Hudson Strait is the insurmountable obstacle in the way of the new route.

THE PANAMA CANAL IN ROME.—The *Bollettino* of the Italian Geographical Society, for November, 1886, takes from the *New York Herald* a report on the progress

of the Panama Canal made by Mr. Nathan Appleton, "Agent of the United States of America (accredited) to the Panama Canal Company."

According to this Italian version, which is not consistent with itself, there remain to be extracted 10,000,000 cubic metres, so that the Canal ought to be opened to the commerce of the world not later than September, 1887; the rate of progress being, on the authority of the Bulletin published by the Company, 1,000,000 cubic metres per month.

The American Government does not seem to know that there is an "Agent of the United States of America in, or near, or about the Panama Canal Company"; but all roads lead to Rome, and some very curious intelligence gets there.

The *Bollettino* is, however, mistaken in announcing that Mr. Appleton's Report will be published in the "BULLETIN" of this Society. Work so well done in Italian need not be repeated in English.

THE GULF STREAM AND THE CLIMATE OF NORWAY.—*Nature*, of Nov. 25, 1886, gives the results arrived at by Dr. Karl Hesselberg, a Norwegian scientist, from his study of this subject.

Looking only at its latitude, Norway should have, in the north, a Polar climate, with eternal ice and snow, and elsewhere a relatively severe temperature. Nothing of this is true. Taking it throughout, the climate of Norway is, on the whole, one of the most favorable on the globe. The character of it is rather insular than continental, the winds blowing throughout the year from the southwest, and warm sea-currents washing the shores.

The chart of the atmospheric depression in the North Atlantic shows for the whole year a strong barometric minimum in the middle of the sea surrounded by Norway, Iceland, Jan Mayen, and Spitzbergen. This creates southwest winds and forces warm water towards Norway and Spitzbergen. The bed of the sea is so formed as to aid in keeping the high temperature. The basin west of Norway is about 2,000 fathoms deep, but the slope into this basin from the shore is very gradual, and the icy cold water which fills the bottom is kept off by the bank and never reaches the Norwegian coast, so that the fjords, which penetrate the land so deeply, do not freeze.

Dr. Hesselberg shows the mean temperature of the air over Europe and the North Atlantic in January. The isotherm 0° —presumably Centigrade, though *Nature* does not state it,—instead of running east and west, goes nearly straight north and south, particularly along the west coast of Norway, which it follows throughout its length from Tromsö, between 69° and 70° , to Christiansand, at about 58° . From Christiansand it turns towards Denmark, thence to the Baltic, comes back to Hamburg, and runs thence in a southeasterly direction across Europe nearly to the Adriatic. Here it first turns to the east, across Turkey and the Black Sea, so that the mean temperature of January on the Norwegian coast, at nearly 70° N. Lat., is the same as in Southern Europe, at nearly 45° .

It seems proper to add that *Nature*, in speaking of the "entire" length of the Norwegian coast from Tromsö to Christiansand, virtually makes Dr. Hesselberg responsible for its own error of nearly two degrees.

TIERRA DEL FUEGO.—Don Ramon Lista, Secretary of the Argentine Geographical Society, left Buenos Aires on the 31st October, 1886, in charge of an expedition fitted out by the government for the exploration of Tierra del Fuego, now partly Argentine territory.

Of recent expeditions to this far-away region, the Italian, conducted by Lieut. Bove, met with disaster and had to be abandoned; and the French mission of 1882 to Cape Horn was undertaken for the establishment of an International Circumpolar Station, and made but incidental explorations.

Señor Lista, in his preliminary letter to President Mitre, expresses the hope of finding in the main island considerable mineral deposits, more especially of coal, besides valuable timber in the forests.

The first report received gives a general outline of the march from San Sebastian Bay to the Bay of Thétys, five miles to the west of Cape San Diego, the southeastern point of Tierra del Fuego. This region the explorer divides into two parts. The northern, from Cape Espiritu Santo at the entrance of the Strait of Magellan to the Cabo de Peñas, is composed of valleys, where admirable pastures are watered by considerable streams that flow from the snowy ranges of the interior. The temperature is agreeable, and the winter snows are light, to judge from the comparative dryness of the soil. South of this pasture land are the Antarctic forests, where the streams are smaller and the open spaces not frequent, while a certain Swiss character is given to the scenery by the mountains, with their numerous small lakes and beautiful woods.

It will be some time before fuller accounts can be had

from the expedition, but a lecture delivered just before its departure from Buenos Aires by the Rev. Thomas Bridges, for twenty-five years a missionary among the Fuegians, furnishes some interesting facts concerning the people and their country.

Tierra del Fuego is properly an archipelago, composed of many large and innumerable small islands. The whole country is mountainous, though there are broad plains in the north. The largest island, named Onisin, from the Ona tribe of Indians, has in its southern part many glaciers and very extensive forests. North of these mountains the climate is comparatively dry, with a colder winter and a hotter summer than elsewhere in the island. The principal inconvenience of the Fuegian climate in general is the lack of summer heat. The highest temperature observed at Usuaia, the missionary station on Beagle Channel, was 70° Fahrenheit, and the thermometer never goes below 12° in winter.

In the central and eastern parts of the archipelago there are four months of hard frosts, while in the west, where the climate is excessively moist, frost is almost unknown, and the fuchsia grows in the open air to a height of sixteen feet, and flowers profusely.

At Usuaia the variations in temperature are sudden and great. Mr. Bridges has known three consecutive frosts at the end of December and snow in January, the midsummer of the southern hemisphere.

There are but five kinds of trees in the woods: three varieties of beech, a magnolia, and the Fuegian cypress. Two of the beeches are noble trees, often eighty feet in height and six feet in diameter; the third, though never so large, furnishes, like the others, an excellent

timber. The cypress and the magnolia have no especial value.

There are three tribes among the Fuegians—the Onas, the Yahgans, and the Aluculufs. It is difficult to arrive at an estimate of their numbers, but Mr. Bridges inclines to think that, all told, they are less than 1,200. The Yahgans, now barely 400, were about 3,000 in number forty years ago, and have been reduced to their present feeble condition by disease, principally pulmonary affections and small-pox.

It is among these people that Mr. Bridges has labored, and he reports that they have made some progress in the arts of civilization, and some acquaintance with the precepts of Christianity. They have built themselves houses and roads, and a school has been established among them. They seem, nevertheless, to have remained substantially in the condition in which the missionaries found them; and their ideas as to the hereafter and the immortality of the soul are extremely vague and confused.

There is no settled custom as to marriage. Polygamy is practised, though circumstances would seem to be against it, and, though no woman has more than one husband at a time, some of them have been known to take more than ten in succession.

The division of labor between the sexes is, on the whole, equitable.

The men collect the wood, make the fire, build the boats, and do the hunting, while the women cook, draw the water, manage the canoes, and fish. It is not easy, however, to accept the statement that the women alone are swimmers.

The reason given is that, in many places on the coast,

there are no trees to which the boats can be tied, so that the women, after landing the men, row to a spot where sea-weeds grow, fasten their boats, and swim back to their husbands. The explanation is more ingenious than the process.

Young people are brought up with care and receive a moral instruction ; but, unlike the youth of more favored climes, they display in their conduct a total disregard of the precepts inculcated.

When a Fuegian falls sick, he is well cared for, especially by the women, but if his case seems to be hopeless, his relatives put an end to him by strangulation, which they call *tabacana*.

The dead are wrapped in skins or branches of trees, and buried near the cabin, or else burned in some open place ; the ashes being then scattered to the winds, or hidden in some remote crevice in the rocks.

THE ELEVATED ROAD IN BROADWAY.—It will interest New Yorkers to learn from a work of Mr. Louis Figuier's, quoted in the *Gazette Géographique* of Nov. 4, 1886, that the elevated road which runs through Broadway is supported on columns placed, not on the roadway, but on the edges of the sidewalks.

It was an act of delicate consideration on the part of the *Gazette* and of M. Figuier to make this arrangement, the rather that the elevated road in Broadway and its sustaining columns have no existence in fact.

Tant pis pour les faits.

DENSITY OF POPULATION.—A study on this subject by M. J. Du Fief is published in the *Bulletin* of the Belgian

Royal Geographical Society for November-December, 1886. The square kilometre used in these calculations is equal to .3861 of a square mile; or, in exact figures, 1,000 square kilometres are equal to 386.1161 square miles.

The population of the globe is estimated at 1,490,900,000, and the number of inhabitants to a sq. kil. is 11.

Europe has a population of 341,714,000, with a density of 33.6 per sq. kil. The countries stand, in the order of their population, as follows:

	Pop.	Per sq. kil.		Pop.	Per sq. kil.
Russia	90,333,000	16	Switzerland . .	2,846,000	69
Germany	46,845,000	87	Bulgaria	2,008,000	31
Austria-Hungary .	38,770,000	62	Greece	1,979,000	30
France	37,672,000	71	Denmark (Faroe &		
Great Britain . .	37,241,000	117	Iceland 83,000) .	1,969,000	51
Italy	29,700,000	100	Norway	1,922,000	6
Spain	16,763,000	34	Servia	1,903,000	39
Turkey	6,642,000	25	Montenegro . .	236,000	26
Belgium	5,853,000	198	Luxembourg . .	213,000	82
Roumania	5,376,000	41	Monaco	12,500	577
Sweden	4,683,000	10	Lichtenstein . .	9,000	58
Netherlands . . .	4,336,000	135	San Marino . . .	8,000	94
Portugal	4,306,000	48	Andorra	5,800	13

The population of Asia is put at 800,900,000, with an average of 19 to the sq. kil. The Chinese Empire comes first with 409,904,000, and 34 per sq. kil.; then British India, with 256,400,000, and a density of 72 to the sq. kil.; then Indo-China, with 38,297,000, nearly half in the French colonies, and densities varying from 8 in Burmah and Siam to 91 in Tonkin and 113 in the Straits Settlements. Japan has a population of 36,700,000 and a density of 96. Russia in Asia has 16,146,000, with a density of 0.3 in Siberia and 17 in Transcaucasia and Armenia. Turkey in Asia has 15,824,000, and a density of 19; Persia 7,000,000, with 4

to the sq. kil.; Afghanistan 6,000,000 and Beluchistan 2,000,000, with a density for each of 8. The population of Arabia is put down at 5,535,000, but no estimate is made of the number to the sq. kil.

For Africa the population is set down at 205,000,000, and the density at 6 to the sq. kil., but M. Du Fief very justly remarks that, except in the case of a few European colonies, the figures for this continent are largely hypothetical. The estimate for Egypt—5,500,000—is certainly a sober one, and shows a density of 10 to the sq. kil.

America has 103,000,000 of people, with a density of 2.5 to the sq. kil. The countries rank :

	Pop.	Per sq. kil.		Pop.	Per sq. kil.
United States of			Argentine Repub-		
America	50,445,000	5.5	lic	2,950,000	1
Brazil	12,300,000	1.4	Central America .	2,780,000	6
Mexico	10,450,000	5	Chili	2,440,000	3
West Indies . . .	4,751,200	19	Bolivia	2,300,000	1
Dominion of Can-			Venezuela	2,122,000	2
ada	4,526,000	0.5	Ecuador	1,000,000	1.5
United States of			Uruguay	560,000	3.3
Colombia	3,000,000	3.6	Paraguay	500,000	2
Peru	3,000,000	3	Guiana	366,000	0.7

The estimate of population for Greenland is 10,000; the area being of course an unknown quantity.

The total population of Oceania is estimated at 39,785,000. Of this number Malaysia has 34,675,000; a density of 17 to the sq. kil. The least density is 2, in Borneo, and the greatest 156, in Java.

In Polynesia the New Zealand Archipelago has a population of 606,000, which gives a density of 2. The highest average is in the Gilbert Islands, 93 to the sq. kil. In the Hawaiian group the density is 4.7 for a population of 80,600.

In Melanesia, Australia has a population of 2,598,000, and a density of 1.3 ; Tasmania 130,000, and a density of 1.9, and the Fiji Islands 128,000, an average of 6 to the sq. kil.

The greatest density in this division is 55, in New Britain, with a population of 100,000.

M. Du Fief's figures agree, for the most part, with those of the *Almanach de Gotha*, for 1887. The *Almanach*, however, makes the population of Russia in Europe 87,472,900, that of Austria-Hungary 37,882,712, and that of Spain 17,266,068 ; and the density one figure higher for Russia, and one lower for each of the others.

The two estimates were probably made from different data, both for time and area.

There is an error in the calculation for Bolivia. The country has an area of 1,297,000 sq. kil., with a population of 2,300,000, and the density is, therefore, not 1, but 1.8, nearly.

DR. TEN KATE IN SOUTH AMERICA.—This explorer left Europe in May, 1885, for the purpose of anthropological research in the northern part of South America, and especially in Guiana. For some months he travelled between the Upper Pará and the sea-coast, studying the various tribes and races and taking measurements, more curious than satisfactory, because he found the types everywhere very much mixed. The maroon negroes on the Saramacca, who have established an *imperium in imperio*, have lost a great deal of their originality. The same report is made of the Karbougros or, as they call themselves, Kalimas or Caribs, a tribe of mingled Indian and negro blood ; of the Caribs on the Wayombo, and of

the Arrowauks on the same river. These have kept up their ancient tribal institutions, analogous to those of the North American Indians. By the beginning of December, 1885, the traveller had secured detailed measurements of 106 individuals, Kalinas, Arrowauks, Karbougros, Maroon Negroes, and Hindoos.

His plan, then formed, of visiting successively the former Carib regions, Guiana, Trinidad, Venezuela, and, lastly, Florida, has been in great part executed, in spite of sickness and the obstacles offered by the uninhabited nature of the country, the heavy rains, and the dense forests. On the Maroni river, the boundary between French and Dutch Guiana, he found, besides Caribs and Arrowauks, Annamites and Arabs, sent over by the French government to complicate still further the ethnological problems of the future.

Dr. Ten Kate took away with him melancholy impressions of Surinam. The country, he says, is neglected in every respect, and the plantations are being abandoned one after another, and given up to the encroaching forest. The population is indolent and without energy, the greater part being creoles of every shade and color, and among them a considerable number of Jews.

From Surinam he went to Georgetown and thence to Trinidad, where he visited the few remaining Caribs dispersed in the mountains. He found them to be, like those of the mainland, hardly distinguishable from the creoles. The Guaranos, living in the delta of the Orinoco, reminded him strongly of the Surinam Caribs.

In Venezuela he rode for eighteen days across the *llanos* from Ciudad Bolivar to Cumaná.

At a place called Aguasai he found a number of In-

dians, who hardly knew the name of the tribe to which they belonged. The country was very poor, and this year a long drought and clouds of locusts had destroyed the crops. At Caripe he stopped to visit the grotto of Guácharo, first described by Humboldt. Dr. Ten Kate was attacked by fever on his return to Carácas and had to give up his intended visit to Florida. His collections will be divided between the Dutch and the French museums.

SOCOTRA.—This island, which was formally annexed to the British Empire in Nov., 1886, has long been under English control.

It lies in the Indian Ocean, 150 miles from Cape Guardafui and 220 miles from the coast of Arabia, in about $12^{\circ} 30'$ N. Lat., and 54° E. Lon. It is 70 miles long, from east to west, and about 22 broad. It is mountainous, the granite peaks on the north side rising to more than 4,000 feet in height. The coast forms a narrow plain of from 2 to 4 miles in width. The valleys are extremely fertile, but the general appearance of the land is barren; and the climate is healthful.

The chief vegetable products are aloes and dragon's blood, the former of singularly fine quality. Domestic animals are numerous, and the butter of the island is exported to the mainland.

Christianity was early established and the inhabitants thanked Albuquerque when, in 1506, he delivered them from the Arab domination. The sovereignty of the island had been claimed by the Sheikh of Keshin, a small Arabian state, and when the Portuguese withdrew his authority was re-established.

The Christianity of the Socotrans became gradually

assimilated to the religion of the ruler, and early in the 18th century had ceased to exist.

The Sheikh of Keshin made a treaty with Great Britain in 1876, binding himself never to cede the island to any other power, and he really loses nothing by the extinction of his title, while England takes a position of immense importance for the control of the Suez Canal.

ORBIS IMAGO.—Under this title Dr. J. Van Raemdonck, of Saint-Nicolas (Waas), Belgium, a scholar well known by his writings on the life and labors of Mercator, has published in a handsome octavo volume a study of the unique Mapamundi of 1538, now in the library of the American Geographical Society.

This *Orbis Imago* is the first general representation of the globe made by Mercator, and his second essay in cartography. Dr. Van Raemdonck's researches enable him to speak with authority on these points; and it is but simple justice to acknowledge that the reproduction in fac-simile of this precious monument is primarily due to his earnest and eloquent representations to this Society.

The projection employed is the double cordiform, and the prime meridian passes, not, as erroneously stated some years ago, through the Cape Verde Islands, but through the Canary or Fortunate Islands. A careful examination with a magnifying glass enabled Dr. Van Raemdonck to establish this fact. The same meridian is made the point of departure on the second edition of the map, published, without a date, at Rome by Antonio Lafreri; on Mercator's terrestrial globe of 1541; and, according to Lelewel, on the maps of the Mercator Atlas.

The rescue of the *Orbis Imago* from oblivion induces

Dr. Van Raemdonck to enumerate other works executed by his countryman, and not known to exist in any collection. These are :

Manuscript.—1. Artistic plans, probably maps, drawn at Louvain, about 1541, for the Archbishop of Valence and the Bishop of Arras.

2. Map of lands in dispute between the Abbot of Saint-Pierre and the Prévôt of St. Bavon. Louvain, 1542, or 1543.
3. Chorography of the Duchy of Lorraine, presented by Mercator to the Duke Charles. About 1564.
4. Copy of a Map of the Holy Land in the Monastery of Our Lady of Mt. Zion at Jerusalem. Sent to André Masius, about 1567.
5. Map of Europe and the Neighboring Regions. About 1554.

Engraved Maps.—6. *Amplissima Terræ Sanctæ Descriptio*. Folio, Louvain, 1537.

7. Map of Europe, referred to in the *Orbis Imago*. 1538.
8. *Europæ Descriptio*. Six sheets; four engraved at Louvain, two at Duisburg. Published at Duisburg, 1554.
9. *Britannicarum Insularum Descriptio*. Engraved by Mercator and published at Duisburg, 1564.
10. *Europæ Descriptio*. Second edition of the 1554 map. Published at Duisburg, 1572.

THE FLORA OF CHILE.—Dr. R. A. Philippi gives in Nos. x. and xi. of *Petermanns Mittheilungen*, for 1886, the results of his study of the changes wrought by man in the flora of Chile. These changes began for the most

part with the arrival of the Spaniards, and have continued to operate more and more effectively ever since until now, when, as he says, the country has in many places an entirely European aspect. Tracts of land, formerly desert but for a few shrubs and bushes, are turned into wheat and barley fields, and vineyards. The pasture lands are covered principally with the succulent *alfalfa*, or lucerne, which grows so vigorously along the whole western coast of America.

Dr. Philippi finds that many native plants of Chile are identical with those of Europe, so that it is not always easy to settle the question of origin.

The maize he believes to have been introduced from Peru, probably before the time of the Incas.

The northern provinces, long condemned to barrenness on account of the dry climate, are now well irrigated and fruitful.

Many of the imported trees grow to an extraordinary size, the *Araucaria excelsa* in particular, which is planted in the *pátios* of the houses in Santiago, and towers far above the roofs, to the astonishment of strangers.

The Eucalyptus is at home throughout the country; but the foreign timber tree most commonly met with in the middle provinces is the pyramid poplar, with which the walks, or *alamedas*, so named from the tree, are planted. The most beautiful of these *alamedas* is, in Dr. Philippi's opinion, the one at Concepcion; but he adds that he has never seen any one walking in these places.

All kinds of fruit-trees succeed in Chile, the peach, the apricot, the plum, the pear, the cherry, and the apple. This last thrives in the southern provinces to such an

extent that cider is the common drink. A curious incident fell under Dr. Philippi's own observation in this part of the country in 1852. In May, of that year, the Valdivia river, swollen by heavy rains, overflowed its banks, and swept away into the ocean millions of apples. These were driven by the north wind to Chiloé, where they were gathered up and made into cider.

The vine flourishes in Chile, and the wine industry is likely to grow into large proportions. Many of the vineyard proprietors are Frenchmen, who are introducing the best European varieties of the grape.

All the berries and the kitchen vegetables grow well.

Dr. Philippi's careful study closes with a detailed list of 332 plants of foreign origin, now domesticated in Chile. Of these but 99 are cultivated, many of the remainder being common European shrubs and weeds.

A DECIDED OPINION.—In the *Mittheilungen* of the Vienna Geographical Society, No. 7 u. 8, for 1886, Dr. Oscar Lenz writes of the Congo and its climate in a tone of conviction :

“The whole Congo basin, as well as the whole of tropical Africa, is, and remains, once for all, an unhealthy and dangerous land for Europeans. Men may try to cover up the fact as they will ; it is of no use.

“I hold every effort to say even one word in favor of the climate to be unprincipled and criminal ; meant only to entice inexperienced people into a place where they must part with all their illusions and risk moreover their health and their life. It is a matter of entire indifference whether the place is on the sea-coast or in the interior, whether the land is high or low ; the climate is and re-

mains an unhealthy climate, and he, who gets out of these regions with a whole skin, may thank his stars."

Dr. Lenz's letter bears date March 8, 1886, at Stanley-Fall-Station. His experience since that time is not likely to have made him think more kindly of the African climate.

SLAVERY AND THE SLAVE-TRADE IN EAST AFRICA.—Ludwig Stross, of Jidda, writes to the *Monatsschrift für den Orient*, of Dec. 15, 1886, a letter which ought to attract some attention.

There is but one way, he says, to put an end to the slave-trade; and that is to bring the whole of Central Africa under European rule or European influence.

Until this is done it will be impossible to prevent the export of slaves by one or another of the many routes. The forcible intervention of the English has merely had the effect of compelling the traders to find new roads.

The Sudan revolt was a movement of the slave-traders, and Gordon would have been able to master it, if he had been supported in his policy of permitting the slave-trade; but the government could not face the indignation-meetings of the good people who supply stockings and flannels for the little negroes; and so Gordon was sacrificed.

The freed negroes on the islands of the east coast have become worthless; and they ought to be made to earn their own support by some such system of control as that which the Dutch Government exercises in Java.

Herr Stross shows fairly enough the difference between slavery in Mahometan countries and that of which *Uncle Tom's Cabin* furnishes an illustration.

During his residence at Jidda he has never seen grown

women imported, none, that is, beyond the age of sixteen; and the most of the slaves are children of from five to eight years. These are stolen by the traders, or bought from the tribe which has sacked their homes, or—not seldom—purchased directly from the parents.

Herr Stross himself knew of one girl in Jidda, who had been bought from her father for a bar of salt.

The slaves exported from Africa are divided into three classes :

1. *Suahelis*, a name erroneously given to all the slaves from South Africa. For these Zanzibar was formerly the dépôt.

2. *Gallas*, or so-called Abyssinians.

3. *Sudanis*, a general name which covers many subdivisions.

Up to the year 1873 everybody in Zanzibar lived on the slave-trade. On the 5th of June of that year Dr. John Kirk, English Consul-General, forced the Sultan to sign a decree putting an end to the traffic. In July, 1873, the price of a slave in Quiloa, a point of supply for Zanzibar, was 3 dollars. On the Somali coast, at the same time, the price rose from 40 and 50 dollars to 80 and 100; and the land routes, which had been abandoned, were reopened.

A similar result followed, though not to the same extent, in the Red Sea ports, the chief entrepôts for the Gallas and the Sudanis. Since 1880, the trade in this direction has increased, and in 1883 slaves, formerly held at 90 to 110 dollars, could be bought at from 40 to 60.

The Khedive's steamers formerly carried this merchandise from Suakin and Massowah to the Arabian ports.

The Sudani commerce was interrupted during the re-

volt, but early in 1886 great numbers of slaves were thrown upon the market. Herr Stross says it is reported that some of the families of the Europeans in Khartum have been sold into slavery, and among them the children of the Austrian Consul Hansal, who had married an Abyssinian.

Mecca is the principal market for the Sudanis and the Gallas, who are there sold to the pilgrims from every part of the Mahometan world.

The slaves captured by the English gunboats and set free are not always left to starve. Some of them have been landed every year at Jidda, turned over by the English Consul to the Governor-General, and by him distributed among his subordinates as *servants*.

Herr Stross's conviction is that so long as Mahometan lands are governed by Mahometans the slave-trade will continue to flourish, and that all the efforts of the European powers to put an end to it will be in vain.

THE MOUND-BUILDERS IN CANADA.—In the *Proceedings* of the Canadian Institute of Toronto, for November, 1886, Mr. C. N. Bell, of Winnipeg, has a paper on the Mound-Builders, whose works have been traced continuously, as he declares, "from the Mississippi below St. Anthony's Falls to Lake Winnipeg, following that line of watercourses from the Gulf of Mexico to Hudson's Bay which divides the North American continent into two great halves, east and west."

Where the halves are so great it is satisfactory to learn that there are but two of them.

A group of mounds at St. Andrew's, 18 miles north of Winnipeg, proved, when examined, to be almost identical

in character with one class of those existing in the Ohio and Mississippi valleys. One was 8 ft. high, 75 ft. long, and 65 ft. wide, and overgrown with oak trees, some of them 4 ft. in circumference. On digging into this construction Mr. Bell came upon a skeleton in a sitting position and surrounded by piles of bones, each surmounted by a skull. Near the sitting figure were found shell beads, tubes of steatite, and a polished sea-shell gorget 4 in. in diameter. In other mounds there were earthen pots, stone mauls, arrow-heads, stone axes, etc., but no metal implements; while copper tools and articles predominate in the mounds on the Rainy River, 200 miles to the eastward of St. Andrew's.

Mr. Bell did not like to offer any theory as to the age of the mounds, but said there was historical evidence that at least 200 years had passed since their erection.

A PHENICIAN INSCRIPTION IN BRAZIL.—The story of a learned imposture is told by Dr. Netto, director of the National Museum at Rio de Janeiro, in a pamphlet inscribed to M. Ernest Renan.

At a meeting of the Historical and Geographical Institute of Rio, on the 13th Sept., 1872, a letter was read from Mr. Joaquim Alves da Costa, of Pouso Alto, Parahyba.

This letter enclosed the drawing of an inscription on a stone, said to have been found on the writer's property. Dr. Netto, to whom the drawing was submitted, recognized the characters as Phœnician and, though not very strong in Oriental learning, undertook to translate them. There was nothing extravagant in the supposition that Phœnicians or Carthaginians had landed in Brazil, and

Dr. Netto worked at his task with energy. Its difficulties were many and great, and he became eager to see the stone itself; but to do this it was first of all necessary to find Mr. da Costa.

The name of his property, *Pouso Alto*, is one so common in Brazil that it gave no help; and to find Parahyba was not much more easy.

There are in the empire two rivers named Parahyba. One of these is in the province of Parahyba do Norte; the other flows through three of the southern provinces; and between the two regions there are 15 degrees of latitude.

Mr. da Costa was nowhere to be found.

The continued study of the inscription confirmed the suspicions Dr. Netto had begun to entertain. One phrase, *Yth alonim valonuth*, was evidently taken from the few Carthaginian words in the *Panulus* of Plautus; and Dr. Netto began to ask himself what Oriental scholars were known to be in Rio.

There were but five; four foreigners and one Brazilian. The Brazilian he had known for many years and did not suspect. To each of the others he sent a copy of the inscription with his translation, asking at the same time for corrections and criticisms. He compared the handwriting in the answers received with that of Mr. Da Costa.

In this way he detected the author of the mystification; and he now publishes the story, with the facsimile of the apocryphal inscriptions, because letters of inquiry on the subject still reach him from time to time.

It is well that impostors should be exposed, but men differ in their appreciation of the methods to be adopted for the vindication of the right; and the one chosen by Dr. Netto does not recommend itself.

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